JULY 1960

THE Airman

OFFICIAL JOURNAL OF THE AIR FORCE

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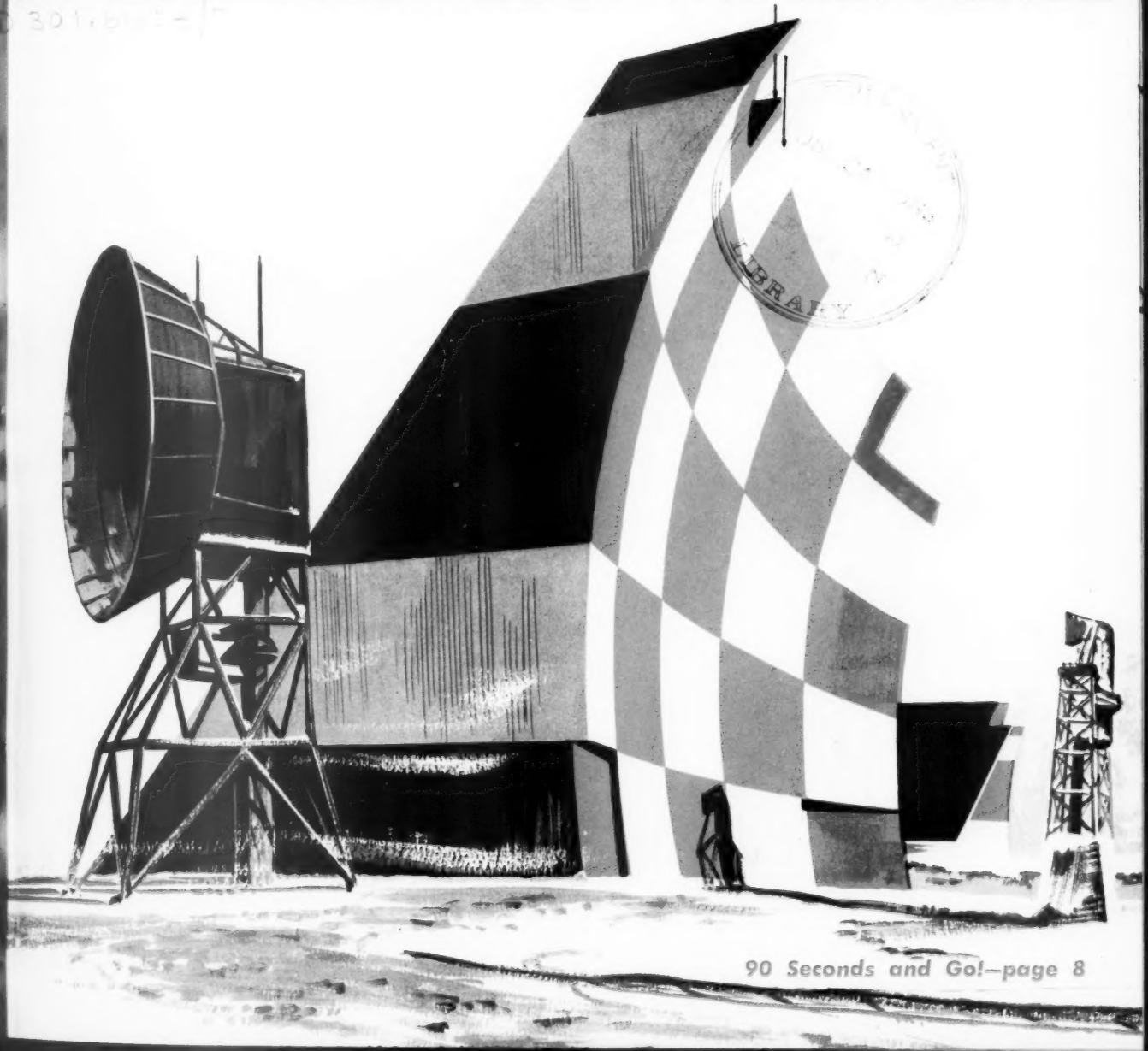
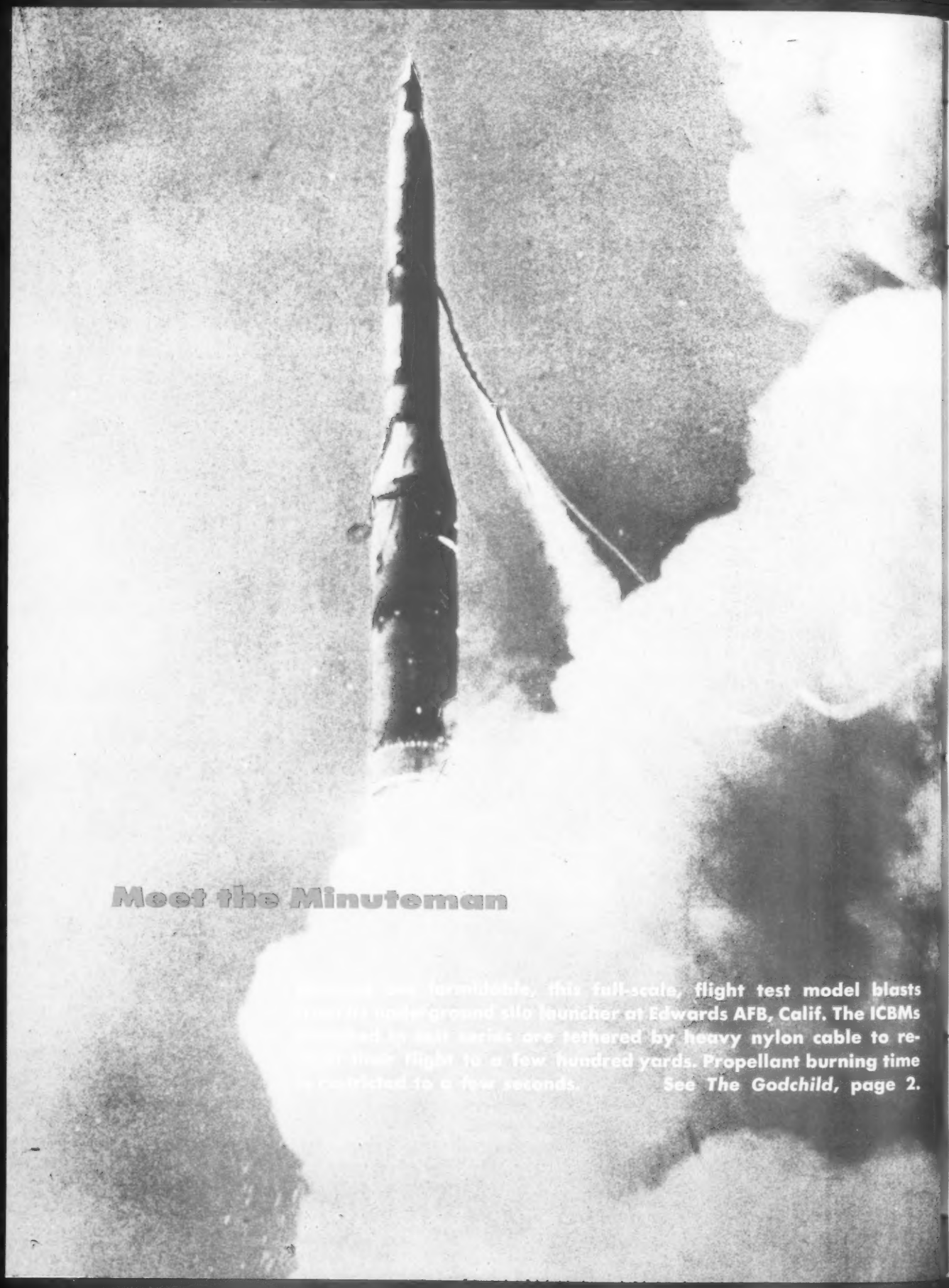


90 Seconds and Go!—page 8



Meet the Minuteman

...formidable, this full-scale, flight test model blasts ...underground silo launcher at Edwards AFB, Calif. The ICBMs ... are tethered by heavy nylon cable to re... flight to a few hundred yards. Propellant burning time ... to a few seconds. See *The Godchild*, page 2.

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OFFICIAL JOURNAL OF THE AIR FORCE

Volume IV, Number 7 July 1960

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Use of funds for printing this publication approved by the Secretary of the Air Force and the Director of the Bureau of the Budget June 9, 1959.

LETTERS TO THE EDITOR

USAFA Stadium

Sir: In all the pictures I have seen of the proposed Air Force Academy stadium, I note that no cover of any type is provided for the spectators. It seems to me this is an oversight on someone's part.

Lt. Col. Rodney Smith
Wright-Patterson AFB, Ohio

• *Where it originated the editors don't know, but it seems to be an unwritten tradition in this country for football spectators to be exposed to the elements. Possibly it stems from the feeling they should be as "manly" as the participants.*

★ ★ ★

Decorations

Sir: In reading your very fine magazine, I noted an error at the top of page 32 in the March issue. The paragraph about SSgt. Disler begins, "The Nation's highest peacetime military decoration, the Soldier's Medal . . ." While this is probably the highest military decoration *normally* received by airmen in peacetime, the Distinguished Service Medal, Legion of Merit, and Distinguished Flying Cross are higher decorations and may be awarded in peacetime.

Lt. Col. Ross D. Norton
Washington, D. C.

Sir: Regarding the award of the Soldier's Medal to SSgt. John Disler, I think the sentence should have read "The Nation's highest peacetime military decoration for valor."

SSgt. Paul Marttila
Robins AFB, Ga.

(Continued on page 26)

★ ★ ★

FRONT COVER

Adapted from Artist Don Jewell's conception of a BMEWS site illustrating General Electric Company's 412L system. Courtesy of GE's Heavy Military Electronics Department, Syracuse, N. Y.

The Godchild

by SMSgt. Edison T. Blair, *Airman Staff*

Our forefathers defended their liberties with tactics and weapons suited to the occasion. Those same tactics and far more effective weapon systems will enable us to protect our heritage and ensure the preservation of our liberty tomorrow.

DESPITE blue skies and a bright sun, a strong, raw, east wind made the morning unseasonably cold. Melting winter snows and spring rains had swollen the small stream to a roiling flood where the crude bridge spanned it on the western outskirts of Concord, Mass.

It was April 19, 1775. By eight o'clock of that morning three or four hundred farmers who would ordinarily have been about their spring chores had gathered in loose ranks at the west end of the bridge. The men were armed. They marched resolutely toward the plumes of smoke rising from their burning stores on the village green just east of the river. Six companies of red-coated British regulars barred their way.

These were the Minutemen, the "embattled farmers," aroused early that day by a horseman shouting an alarming message signaled with a lantern from a Boston church steeple the night before. By nine o'clock that morning two Minutemen and three British soldiers lay dead at the bridge. Before midnight the disciplined British had suffered 273 casualties. The American farmers, their number grown to 4,000, counted 95 dead, wounded, or missing.

Before the fighting ended eight years later, the fiercely independent Minutemen and their neighbors in other American colonies had "brought forth on this Continent, a new Nation, conceived in liberty. . . ."

Many times since then this Nation of liberty-loving, independent, and democratic individuals has defended the principles affirmed in blood that April day 185 years ago. It will defend them again when necessary and a modern day *Minuteman* is being readied to help accomplish the task.

The modern *Minuteman* is a three-stage, solid-fuel intercontinental ballistic missile (SM-80) being developed for Strategic Air Command. The first missiles are planned to become operational in 1962. Like their godparents, they will be formed in loose ranks—widely dispersed in bombproofed holes in the ground that resemble inverted silos.

The Minuteman of '75 fought Indian-style—moving often, firing from behind stone walls and trees, offering only a small part of his body as an enemy target. Some of the *Minutemen* of '62 will be completely hidden. Others will be constantly moving along the thousands of miles of railroad track that crisscross the United States.

Like the Minutemen at Concord bridge, the first SM-80 squadron will be followed by others. *Minuteman* missiles will be capable of being fired in a wide variety of launch patterns, to rain devastating retaliation upon any enemy who dares attack the U. S.

The USAF *Minuteman* will be the Free World's first mobile missile with 5,500-mile intercontinental range. The mobile squadrons will be housed in conventional-looking railroad cars traveling at random over our vast rail network. Outwardly, these railroad cars will look like any of the thousands of others carrying meat, produce, fertilizer, lumber, and machinery. But inside the select group of specially constructed cars will be the *Minuteman* with its operating crews, launchers, and relatively little support equipment, ready for launch on order. Such mobile missile sites will not provide targets for the enemy.

Survey work for the first hardened sites at Malmstrom

AFB, Great Falls, Mont., is already underway. Malmstrom is one of the bases where lend-lease aircraft produced in the U. S. staged for delivery to Russia during WW II. Prototypes of the *Minuteman* railroad cars are being constructed and will be ready for route testing on the Nation's railroads soon. By early April 1960 seven full-scale test models of the *Minuteman* had been successfully fired from test silos at Edwards AFB, Calif. There had been no failures.

Not Second Generation

The high reliability of the *Minuteman* stems directly from the technological refinements of earlier systems. This technological evolution has led many people to refer to the *Minuteman* as a "second-generation" missile. Since the beginning of the Air Age which is still fresh in our memory, the second-generation term generally implied that since the younger, more advanced aircraft weapon systems could do a specific job better and quicker, the older aircraft were doomed to obsolescence.

But this implication does not hold true in the Aerospace Age with its emphasis on missiles. The *Minuteman* is not intended to do the *Atlas'* job as the B-52 now does that of the old B-36. The bigger *Atlas* and *Titan* ICBMs are still needed and will continue to be needed for the job they were designed to do—deliver high-yield weapons. The *Minuteman-Atlas* relationship will be comparable to that of the B-52 and the B-58—different systems to meet different requirements.

The recent shift in funds to buy still more *Atlas* systems is ample proof that top defense officials and Congress do not consider the *Atlas* obsolete. This same shift of funds re-emphasized the value of mobility and flexibility in the *Minuteman* systems. So rather than a second-generation missile, the *Minuteman* might be more aptly called a "second-growth" system, simply a new branch on the family tree of ICBMs adding to our deterrent capability. When viewed from the growth angle, even the *Atlas* squadrons now becoming operational are substantially different from the first squadron. Both the *Atlas* and *Titan* systems will continue to grow in reliability and effectiveness.

Refined

What are some of the technological refinements that produced the second-growth *Minuteman?*

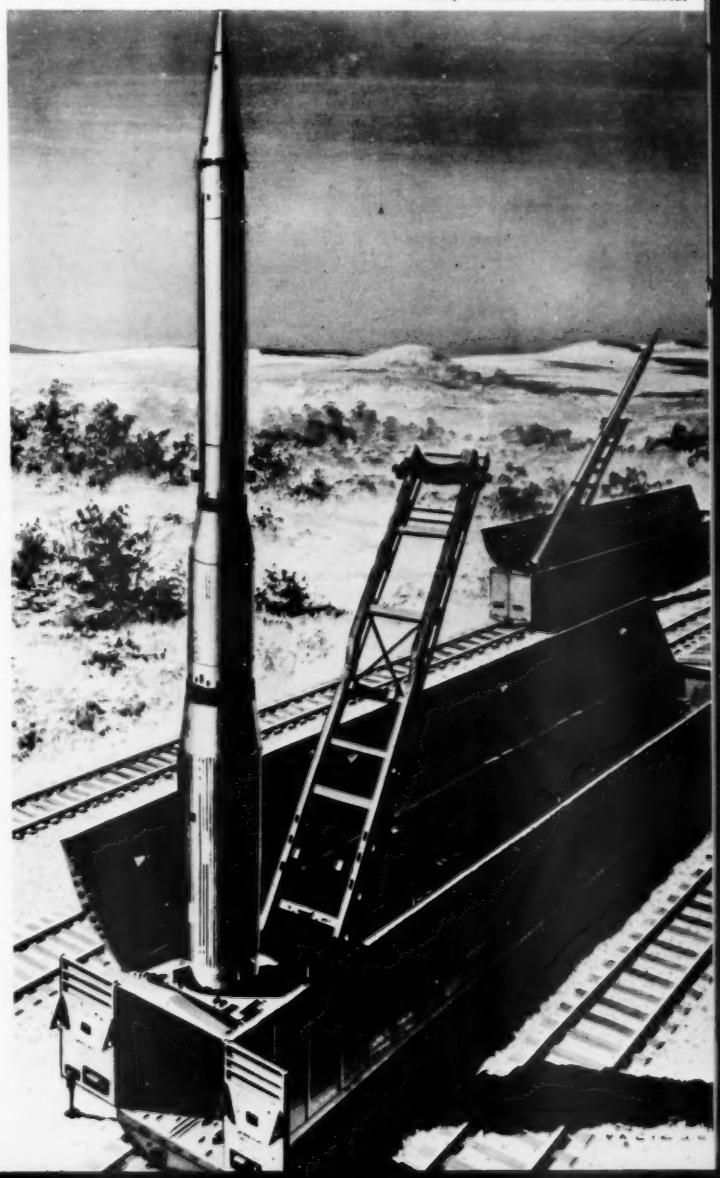
First, there is the solid-fuel engine designed for instant readiness, simplicity of design, and low maintenance requirements. Mechanically, a solid-fuel rocket engine consists of a pressure vessel or case, a solid propellant grain, an igniter, and an expansion nozzle. It has no maze of valves and plumbing, therefore, fewer parts to malfunction. It requires no complicated countdown as we have come to know it. Propellant grains are bonded to the case and burn from the inside out; thus the case needs no heavy strengthening nor thick-walled insulation. Only the nozzle must withstand high temperatures. The whole missile is smaller and lighter.

This reduction in size and weight not only contributes to its mobile deployment, it also makes the *Minuteman* easy to transport by air, truck, or rail to launch sites. The SM-80 will be fully assembled and checked out by the contractors at centrally located production facilities where precision procedures can be followed. Rail-mounted missiles can be readied and completely checked out right at the assembly point.

Boeing Airplane Company is the assembly and test contractor on the Air Force-science-industry team developing the system under supervision of Air Research and Development Command's Ballistic Missile Division. Other associate prime contractors are Thikol Chemical Corp., Aerojet General, Hercules Powder Company,

An artist's conception of the Minuteman of '62 and the railroad cars that give it the mobility required for Indian-fighting tactics envisioned for its employment.

Courtesy Association of American Railroads



AVCO Corp., and Autonetics Division of North American Aviation. Systems engineering and technical direction of the development phase is being done by Space Technology Laboratories, Inc.

On Site, On Target

The *Minuteman* missiles going to permanent sites will need only to be placed into position, then tied into the communications and monitoring equipment with a minimum of checkout. Thus there will be no need for expensive, extensive maintenance facilities, and highly skilled technicians at launch sites. The SM-80 systems can be stored for relatively long periods with a minimum of maintenance without impairing their readiness.

Once the lid is closed on the silos, site security can be handled by roving patrols and the automatic electronic security system from the underground control center. Through an intricate, jam-proof, electronic sensitive command control system, missiles can be launched with a great degree of operational flexibility.

These modern *Minutemen* that still use the tried and true Indian tactics, maintained in a state of constant and instant readiness awaiting a signal from an electronic Paul Revere who rides at the speed of light, are a major contribution to our Aerospace force of manned bombers, fighters, and missiles. They will be a manifestation of an Air Force policy voiced by the Chief of Staff, General Thomas D. White, a few months ago.

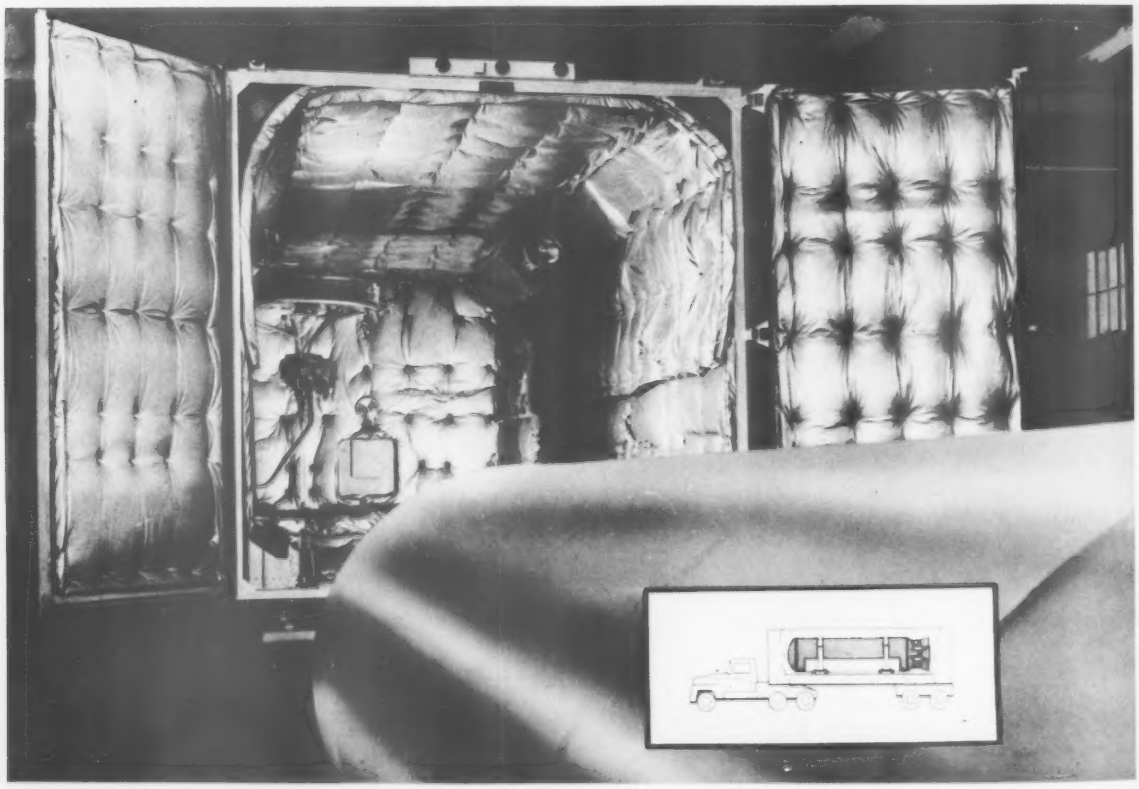
"We must continue to develop our forces along a broad spectrum," he told Congress. ". . . one which will provide effective and versatile advanced systems to meet the wide range of contingencies which may confront our Nation. . . .

"The *Minuteman* is one of the most economical offensive weapons in recent history. In place, and ready to go, we expect the *Minuteman* to cost less than either the *Atlas* or *Titan*."

Actually, the *Minuteman* reverses radically the increasing cost trend of modern weapon systems both in terms of dollars and in terms of manpower, the Honorable Dudley C. Sharp, Secretary of the Air Force has pointed out. This economy is the direct result of the technological growth of the missile.

The *Minuteman* of '62, though smaller and lighter than the *Atlas* and *Titan* out of which it grew, can take care of a great many enemy targets and leave bigger, tougher targets to the bigger ICBMs. Because it is cheaper to produce, the *Minuteman* will eventually confront an enemy with a diversified strategic power extremely difficult, if not impossible, to destroy.

The interior of a temperature and humidity controlled transporter for the combat-ready, solid-fuel Minuteman ***engine as shown in cutaway. Similar transporters will adapt entire missile and erector to highway travel.***



MILITARY MAGIC MAN

The age-old phrases of "abracadabra" and "watch closely, the hand is quicker than the eye" may be as jaded as a Wright *Flyer,* but they took on a jet look recently in the far reaches of Alaska.

The ingredients for this happy circumstance were almost as mystifying as the sleight-of-hand that transpired.

As the magician would say, first you take one part remote USAF site, then mix thoroughly with one part tiny Alaskan town, one part heart-as-big-as-a-house, and several parts willing performers. The result, eye-popping magic, toe-tapping rhythms, and what may well have been the world's most appreciative audience.

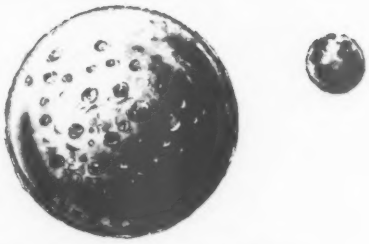
Probably the happiest individual who witnessed the miracle was Maj. John Gootee, commander of the first part of the magic formula. His AC&W Squadron at Unalakleet AFS is one of the most remote in the Air Force. But, compared to the Eskimos in the adjacent village, his men are true cosmopolitans. Few of the natives, born and raised 150 miles north of the Arctic Circle, have ever been away from the local town. More important, none had ever seen live entertainers.

Consequently, when Major Gootee appealed to Eielson AFB for such a troop, he was speaking one word for the local airmen and several sentences for his native neighbors.

Officials at Eielson answered his pleas with Warrant Officer Bill Burns and his tuxedo-clad "Top of the World" Band, Capt. Bob Falkner and his zany bag of tricks, and A/2C Hugh Wilson master of ceremonies.

Their audience ranged in age from 8 to 80; their stage was the village school auditorium; their show an enchanting 90 minutes of make-believe.

And what was the result? Take a look at the accompanying pictures for your happy answer.



A VOICE FROM THE MOON

Reprinted from the May Reader's Digest.

condensed from a Sermon by Rev. Carlton C. Allen

HIGH IN the nose cone of the mighty space vehicle, 140 feet above the launching pad at Cape Canaveral, the astronaut lay still in the scientifically shaped contour bed. For an hour and a half he had been alone with his thoughts as the countdown proceeded. There was still half an hour to go. Every tank and valve, every transistor and circuit, literally every square inch of the great pulsing rocket was being checked and double-checked.

In the blockhouse below, 20 men worked methodically, answering the steady voice of the checker. On the firing platform the hardhats were slowly filling the fuel tanks. The astronaut's only knowledge of all this activity was the blinking of tiny green lights on his instrument panel. He had been through it in the simulator many times before in the last five years. But this time was for keeps. He was going to the moon.

Fifteen minutes now. The gantry pulled away; the great rocket stood alone, wreathed in fog. In five more minutes it would try with all its explosive heart to deliver a man to the moon with enough power left to get him back. The combined scientific effort of a nation was within five minutes of its greatest test.

The astronaut's thoughts in those last five minutes were of one small family. His wife and children would not know until they heard his voice from the moon whether he was the chosen one or not. But his wife was prescient. When he had left the house the day before she had put in his hand a little card on which was typed, "If I ascend into the heavens Thou are there," *Psalms* 139:8. He looked now at the card, taped onto the instrument panel.

The ten count began. He said a quick little prayer, closed his eyes and relaxed every muscle just as he had practiced it so many times. There was a sharp shock as the mighty engines were fired, a growing tremor as they built up power and thrust. He felt the rocket move up around him as he sank into the foam rubber and the shock absorbers strained to meet the acceleration. The dial swung to 5—10—15 G's. He now weighed 2550 pounds—15 times his normal 170. Each arm weighed 250 pounds, each eyeball three pounds. Sixteen seconds until balance, until his own inertia had been overcome. Then he felt the first stage burning out, disengaging and falling away.

He was out of the earth's atmosphere in empty space. The second stage fired and again there was the build-up of G force and again an exhilarating relaxation. He pressed a button and the nose cone cover opened and drifted slowly to the side. Now he could see the jet-black sky through the three small windows around him. He was traveling 25,000 m.p.h., but there was no sensation of movement. Millions of stars looked upon this strange invader without blinking. Not one star could be recognized, for his position in the universe was constantly changing. There was no north or south, no up or down.

Then, out of the void, came a familiar, friendly voice. "Space One—Space One—Canaveral calling. Blast-off perfect . . . stages one and two fired perfectly. Can you hear us? Over!" His answer was clear, buoyant and optimistic. "Rocket performing beautifully—every light green. Over."

And now began the monotony. Two and a half days of weightless speeding through space. Then the great pock-marked face of the moon appeared at his window.

What a fantastic sight! Crystal-clear the gigantic buttes, canyons, mountains and broad dusty plains of the moon loomed past his window, then disappeared as the rocket started to turn tail-down for the landing. He put on his space suit, hooked into the oxygen supply, and lay down in his contour chair. The deceleration is easy since the moon's gravity was low. He felt the feet of the landing pads sink into the powdery surface and suddenly all was still.

He was on the moon. Quickly he radioed, "Landing routine. We have made it!" He stepped out—the first human being to impress a footprint on the sandy surface of the moon.

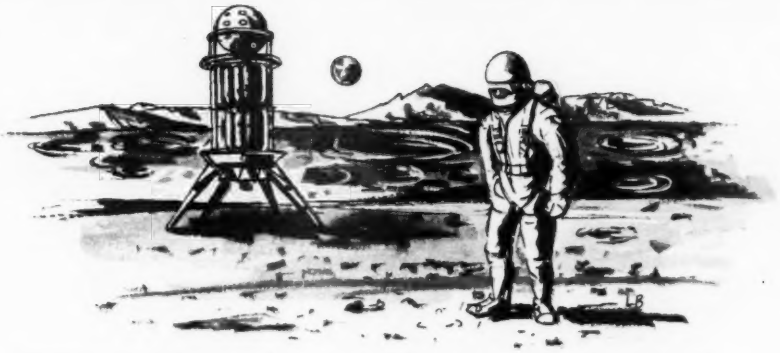
He began his scientific duties. Samples of the dust and the rocks, tests for radioactivity, telescopic pictures of the planets. Carefully down the check list the astronaut performed every chore and radioed back his information to the eager scientists at Cape Canaveral.

But the planners of the moon shot had had the counsel of wise men other than technicians. They knew that something more than a mechanical response would come to this astronaut when he stepped out on the surface of the moon. So the planners had left the astronaut one hour with his own thoughts and feelings. One hour without any duties or responsibilities.

Now the astronaut walked about on the moon's barren surface. He came to a little rounded hill and in two record-breaking jumps, thanks

to the moon's low gravity, he mounted it. There was not a movement, not a sound.

The primeval desolation around him, and the sense of isolation within, stripped his mind of the vast accumulation of experience which every living personality carries. Somehow he could not escape the overpowering feeling that this hour of solitude might be the real reason man had been allowed to reach the moon. And he was suddenly overwhelmed by a sense of coming here to meet someone, perhaps to hear a message for all mankind.



Rev. Carlton C. Allen, now Pastor of the Presbyterian Church, Bound Brook, N. J., served as wing chaplain with the 314th Bomb Wing of the 20th Air Force during World War II. "This is a story I felt I must tell as soon as possible," he comments with deep feeling. Readers will be glad he did.

He looked out across the face of the moon in wonder and then in the silence of his soul he heard the message: "You, Astronaut of Earth, are now standing upon an uncontaminated celestial body. Across these dusty plains and in these towering mountains there is not, and never has been, the slightest stain of sin or evil. No lie has yet been told in this silent world. These rocks are unstained by the blood of war. You, Astronaut of Earth, are privileged to spend one short hour in a clean environment. This is the purity of the universe as it was when it left the mighty hand of God. This is a world as pure as the one God gave to Man."

As the astronaut stood shaken by these thoughts, the words of John in Revelation came to him: "I saw a new heaven and a new Earth. I heard a great voice saying: God will wipe away every tear. There shall be no death, mourning, crying or pain. Neither shall there be any curse there. Nothing unclean shall be there." And it flashed through his mind that he was literally standing in a new heaven and upon a new and unstained earth.

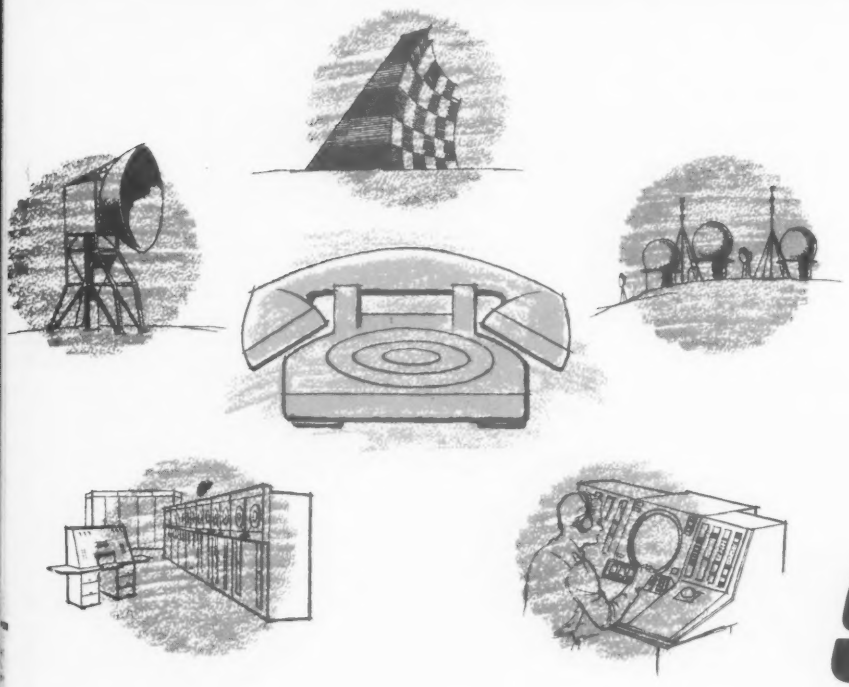
At that moment the astronaut raised his eyes to look upon the most beautiful and amazing sight that had ever burst upon the vision of man. Up from the sharp horizon of the moon rose the shining orb of Earth. He stood transfixed. His eye in a single moment swept from the snowcapped arctic to the snowcapped antarctic, with the oceans, the continents and the vast blanket of white glistening clouds in between. That slowly turning sphere held upon its broad bosom all that he loved and held dear. There lay America, land of the free. Yonder lay Africa and Europe and Asia, turning into the sunrise. From this distance it looked as pure and beautiful and unstained as the moon upon which he stood. No sign of sin or greed or selfishness or violence could be seen.

But the astronaut was a human being. He was of the earth earthy, and now he felt his humanity as never before. In dismay he fell to his knees. Quietly he prayed, "O Lord, I am a man of unclean lips and I dwell in a world of people with unclean lips. We have filled the world with hatred, lies, jealousy and immorality. Father forgive us; for we know not what we do."

And God said to the astronaut, "I know, I know. I too love that earth. My own Son once walked its shady paths, drank from its cool springs, looked upon its beauty—and He, too, felt the sharp stab of its sin. But I still believe in My creation. There are yet thousands that have not bowed down to evil. I still hear prayers of unselfishness and compassion. There still abideth faith, hope and love upon that planet. Purity and truth do indeed suffer eclipse now and then, but always remember the enduring continuity of holiness and peace in the eternal kingdom of God. Go back, Astronaut! Go back, and lo, I am with you always."

His hour was up. It was now time for the astronaut to speak to Earth. What could a man say to match this moment and these mighty thoughts? And then he realized that God had already said it. He switched on his radio and, as those on Earth strained to listen, this is what he said: "Our Father, who art in these heavens, hallowed be Thy name. Thy kingdom come, Thy will be done on yonder earth as it is in the heavens. Yes, give us this day our daily bread and forgive us our sins as we forgive those who sin against us, and lead us, lead us away from temptation and deliver us from evil for Thine is the everlasting kingdom and the mighty power and the shining glory forever. Amen."

Without another word, the astronaut switched off the radio and climbed back into the space ship for the long flight home.



90 seconds a

by Capt. Ted R. Sturm (Ret.)

In 1936 Adolph Hitler defied the Versailles Treaty and ordered his army into the Rhineland; General Franco led his troops in a revolt that triggered the Spanish civil war; Edward VIII abdicated; Americans were at the midpoint of their climb out of the Great Depression and roughly 20 million home-owned radio sets crackled to the tune of "Happy Days Are Here Again."

Against this backdrop of buoyant spirits undampened by the ominous rumblings in Europe, a noted scientific author and associate professor of chemical engineering at Yale University, C. C. Furnass, published a revealing book entitled *The Next Hundred Years.*

"As soon as television becomes a reality for the average American," he wrote, "the last frontier of communication will have been closed. . . ."

Twenty years later there were more U. S. homes equipped with television sets than there were homes with radios at the time of Furnass' writing. But far from closing the frontier, this nebulous milestone really turned Furnass' "last frontier" into a first frontier.

It is noteworthy that the television goal Furnass cited as a possible criterion by which to determine communication's terminal point was reached just four years ago. Yet within the last few months, home-owned TV sets passed the 50 million mark; the National Aeronautics and Space Administration regularly transmitted and received communications from *Pioneer V,* in excess of ten million miles out in space; the TIROS reconnaissance satellite orbiting the earth has been taking and transmitting television pictures of our globe; the Strategic Air Command installed a voice communication system enabling the commander to speak instantly with the key men of any one or several of his more than 2,700 aircraft and missile units almost anywhere in the world they might be; the Air Force communications complex, in one year's operation, handled 34 million messages; and civilian scientists were seriously planning space relay stations circling 22,000 miles above the earth to permit television on a global basis and telephone contact with future spacecraft.

The purpose here is not to decry the predictions made by Professor Furnass, but to show by comparison the difficulties of estimating the advance of technology then, and now. If scientists are often stunned to find themselves and their saddles sitting momentarily in the dust while the stallion of communications and electronics disappears over the horizon, how can a layman hope to remain astride this supersonic Pegasus? The answer is, he probably can't, but while he is struggling to keep pace he can at least relax and enjoy the sensations of amazement brought about by increasingly frequent revelations of almost unbelievable developments.

For in truth, the profound complexity, myriad aspects, and changing complexion of the entire communications and electronics realm today are not only beyond the comprehension of the average citizen, but even befuddle the minds of professional airmen. There are so many

Our deterrent forces have 15 minutes to get on their way; Communications has 90 seconds to tell them they must.

seemingly unrelated yet homogeneous subdivisions, it is doubtful any one individual could ever attain complete grasp of the entire field. Yet with approximately 112,000 (about one of every eight) Air Force members directly related to communications-electronics work by AFSC, it is essential that people concerned with Aerospace forces learn as much as possible about this field.

Money, on the other hand, is something everyone readily understands. A year after Furnass published his book, the combined total expenditures covering *all* operations of the U. S. Army and Navy amounted to slightly over one billion dollars. In FY 1960, the U. S. Air Force will spend roughly three to four times that amount for communications and electronic functions alone.* This will amount to nearly 27 percent of the total USAF budget. What it means in terms of national survival is that without the facilities procured by this and previous money, the nation's Aerospace forces would be, on a comparative basis, about as dangerous as a deaf, mute, and blind prizefighter.

Despite this tremendous cost, effective management and automation have made it possible to handle a highly increased flow of communications traffic in proportion to people assigned. USAF's communications complex is currently three to four times larger than the Army Signal Corps in all major aspects and is as large as any commercial communications concern in the world.

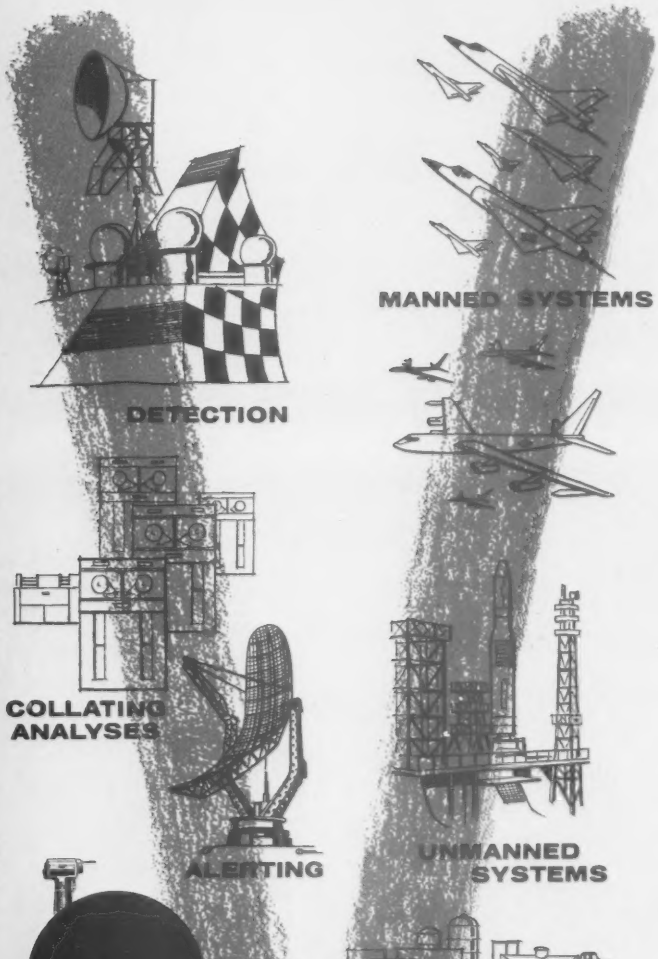
Communications-electronics is an indispensable thread woven throughout the nation's defense cloak, holding together the offensive and defensive weapons upon which national survival depends. Without it, the Free World's protective raiment would fall in tatters about its feet, leaving it embarrassed and vulnerable to the Communist blizzard set to rage in from the polar regions.

From the Dew line and the soon to become operational Ballistic Missile Early Warning System (BMEWS), to the telephone on the clerk's desk, communications-electronics in varying degrees has created the character of life as it is lived and defended by mid-twentieth century man. At the present rate of its growth it will soon be capable of detecting an attacking aerospace weapon, identifying it, reporting its presence to an entire continent, selecting the weapon to attack it, launching the weapon, guiding it to its target, destroying that target, and simultaneously launching a retaliatory force *all without the necessity of any human voice speaking a single word*. It is doubtful, however, that this full capability will ever be exploited, because final decision must remain in human hands.

Recent and Rapid

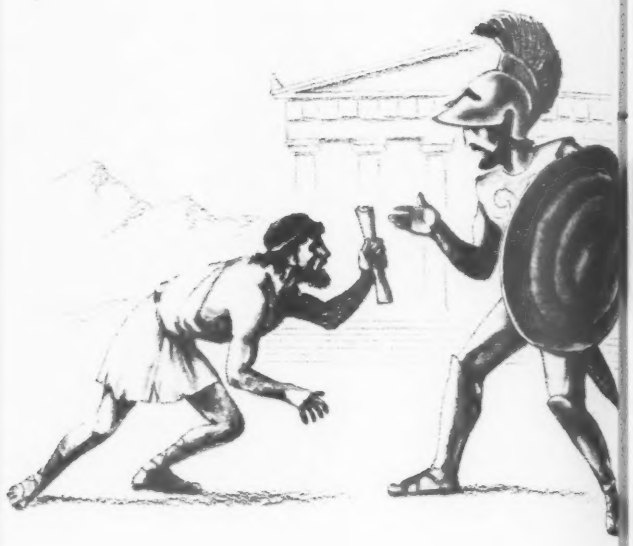
That such an advance has taken place in the last 100 or so years is even more startling when viewed from an historical perspective. The classic example of the first wartime communication system is the story of Pheidippides, who sprinted 150 miles from Athens to

* Estimates range from 2.6 billions to 4.9 billions depending upon whether installations, logistics, supporting facilities, etc., are included. The exact amount lies somewhere between these figures.



COMMUNICATIONS-

Man and Weapons Systems Integrated for Defense



Sparta, seeking assistance for the Athenians who were besieged and outnumbered by the Persians. Although Pheidippides was reliable enough as a communications system, the priority wartime traffic overloaded his circuitry and he dropped dead shortly after delivering the message.

This happened in 490 B. C. By Julius Caesar's time, armies had built redundancy, duplication, and relays into their communications system, but the components were still human. One early-warning net consisted of sharp-eyed, loud-mouthed Gauls perched on mountain tops. They alerted their country through an ingenious vocal relay which ranged from Auvergne to the marshes of the Rhine. Subject as they are to laryngitis, men were soon replaced by early-warning geese, which sounded their unmistakable if confusing calls to arms in sufficient time to alert Rome to an attack by the Carthaginians.

Electronics didn't enter the picture until roughly 2,000 years later, and effectively, present day communications and electronics has developed within the last century. And even within that period, more progress has been made since 1951 when the Air Force implemented the first semi-automatic switching center and the first use of ionospheric scatter, than had been made since Marconi flashed his signal across the Atlantic in 1901.

Yet even the Gauls' ingenious early warning net was based upon the same principles as our multibillion dollar complex is today; to alert defensive forces; launch counter forces; and trip the signal that warns

The **Short Order** *communications system allows SAC's commander in chief to communicate with airborne aircraft. This is the master console of the system, which uses single sideband transmission. TSgt. Jack Houser, left, and SMSgt. Ray Wilson are the technicians.*

citizens to take those civil defense measures necessary to safeguard life and property.

The primary and readily apparent difference today lies in the factors of performance, time, and space—where performance must be reduced to a minimum of time and space to a question of time. Early warning communications is somewhat less vital, therefore, to a nation with aggressive intent. Such a nation can perform its aggressive act at a time of its own choosing; thus, it need not fret about immediate reaction to a surprise attack.

To the nation committed to a policy of deterrence based upon a capability for strong counterforce action however, communications-electronics is the indispensable key on which the success of the policy pivots. Assuming that it maintains the forces necessary for massive counter attack, its effectiveness then depends upon adequate warning so the strategic force can be launched before it is destroyed, and simultaneously, the air defense forces can get off to minimize the enemy blow. The nation, of course, must be alerted so that civil defense measures can be taken.

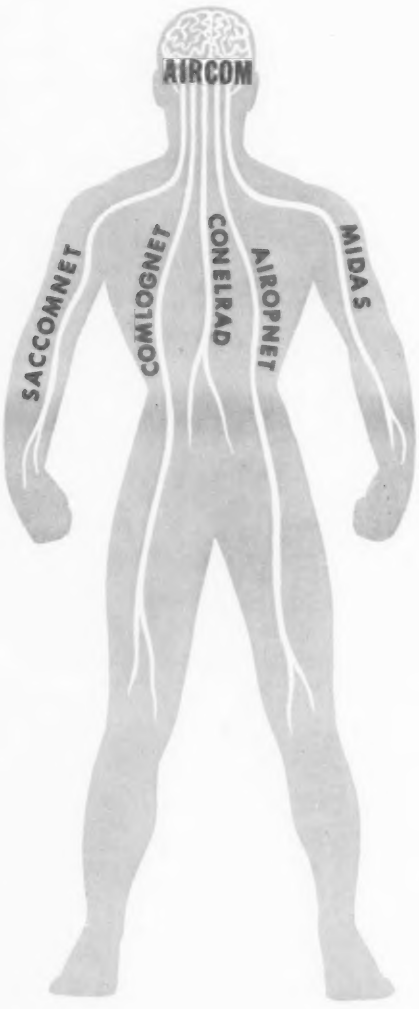
These factors constitute the foundation for the modern Aerospace doctrine that offense and defense are interdependent and any one of these factors by itself is inadequate as a military posture today.

Because forces must train, our strategic and tactical units may at any given moment be anywhere in the world. Where reaction time is measured in seconds, these forces depend on a communications-electronics complex to provide the means for instantaneous command and control. Such a complex is no longer a service to these forces but an integral part of the weapon systems.

For this reason, the complex is tailored essentially to the requirements of the Aerospace forces which must be the first to react. It is obvious, too, that the men who control the forces must necessarily control the system to which the forces respond.

An old military adage proclaims that Congress can make a general, but communications makes him a commander. General Power, SAC's commander in chief, affirmed this when he recently said, "Without communications, I can't command anything but my desk."

Early warning is only part of the global communications-electronics picture, albeit an essential part. Integration of all phases of this art is so near complete that it is necessary to comprehend the whole before any one



part makes sense. One cannot understand the principle of an automobile engine without knowledge of the carburetor.

Hard to Separate

Communications-electronics is a compounded term used all-inclusively by the Air Force because it's becoming virtually impossible to separate the functions of the two. Like air and space, it's hard to tell where one ends and the other begins.

When used singly, communications is defined by the Air Force as the facilities and functions involved in transmitting information. Electronics is interpreted as that equipment which can be categorized as radar. Yet even these interpretations do not always accurately reflect the true meaning and officials readily admit that communications-electronics is an unwieldly nomenclature, awkward to use in speaking or writing. Perhaps a new term, such as "Comtronics" or "Teletronics" might eventually resolve the problem.

The hyphenated designation includes an impressive list of operations, devices, and installations covering all means of sensing, transmitting, receiving, collating, analyzing, and displaying data. There are radio and wire facilities and systems for messages, graphics, and traffic concerning command and administration (including logistics), aircraft movement and control, and weather observation and forecasting.

There are ground radar units and radiating devices of all types—for air traffic control, aiding navigation and bombing, aircraft and missile identification and recognition and control of guided missiles in flight.

There are airborne radars, radios, fire-control systems, computers, bombing and navigation aids, and complete units of specialized equipment for electronic warfare. This list is by no means complete, of course, because by the time the reader completes this article, new developments will have undoubtedly added additional items.

AIRCOM

Chief communication organization supporting all tactical and strategic forces is the USAF's Communication Complex called AIRCOM. It is operated primarily by AACS.

At the end of FY 1959, AIRCOM facilities were valued at several billion dollars, but even with this, it was necessary for the Air Force to lease, for FY 1960, 117 million dollars worth of commercial facilities containing the staggering total of four and one-half million circuit miles of leased wires—enough to circle the earth 168 times.

Operating 24 hours a day, this is the system that last year handled 26 million messages—a number more meaningful when it is understood that stacked in book form, they would tower 10,000 feet high. Voice channels, incidentally, exceeded 250,000 miles of long range, high quality circuits, and the figure is expected to increase to 868,000 by the end of this fiscal year.

Some understanding of the necessity for such extensive facilities can be gained by an insight into a few of the problems inherent in maintaining global forces prepared to go to war in 15 minutes. This imposes a requirement for vast amounts of intelligence information of all types.

Further, it is essential that the exact status of our own and allied forces—i. e., in-commission rate, readiness of crews and weapons, target assignments, capability of diversion—be known to commanders at every instant.

Vast quantities of this information must be acquired, digested, collated, examined, cross referred and displayed. This is now done by electronic data-processing through ingenious, mammoth computers which are tied into, and rely almost completely upon, the Air Force Communications Complex.

AIRCOM contains several networks specifically configured to serve the needs of major Air Force commands and other agencies. It has 33 key stations, plus many smaller units, which reach into every corner of USAF operations. It is to the Air Force what the nervous system is to the human body—if you sever any part, the area it serves may become dead or useless unless an auxiliary system is available to fill in.

One major network serves the strategic striking force. It is SACCOMNET (short for Strategic Air Command Communications Network) and it connects the commander in chief, SAC, with every one of his farflung units. SACCOMNET is reserved for the constant, heavy exchange of information vital to the commander's control of his massive organization. The primary system for alerting SAC forces is connected to the famous "Red Telephone" at the SAC underground Command Post. Stretching from there is a two-way, ethereal highway to everywhere. SAC's commander can speak directly to unit command posts and other units spread throughout the world.

For its day-to-day peacetime—as well as wartime—control and coordination of its forces, SAC also runs a private telephone system which connects each distant major point of interest with SAC Hq. By pushing a button you can call your counterpart in England or some other distant point easier than you can pick up the phone and dial your wife at home.

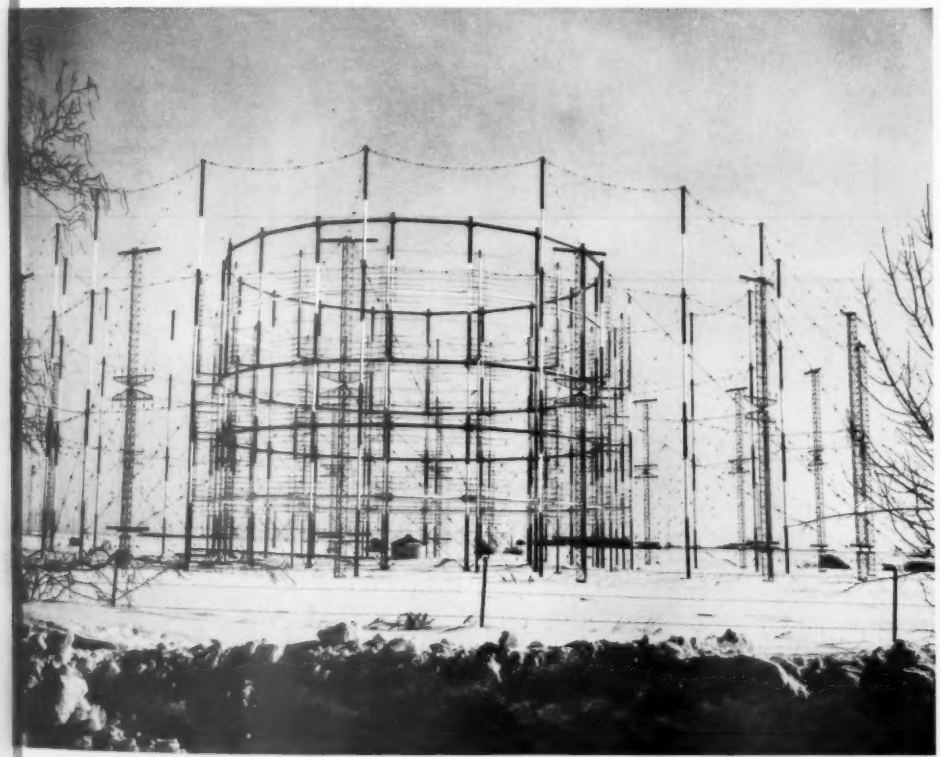
If part of that system is lost for any reason, an alternate system of some 65 shortwave raidotelephone stations is also located across the northern hemisphere. These high-frequency radio stations use the single sideband suppressed carrier mode of operation and are completely compatible with the telephone system. Each of these stations acts as a switchboard with the capability of interconnecting any wire or radio circuit with another.

Conspicuous Only by Absence

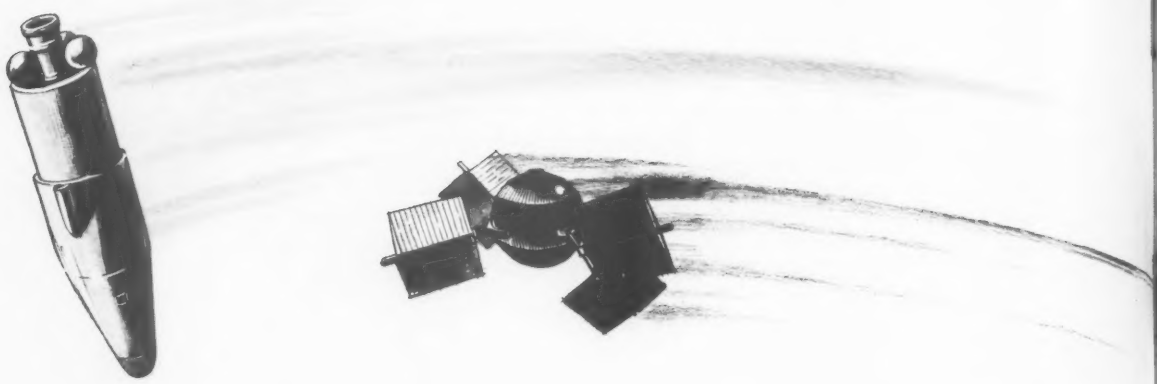
A network less glamorous but just as important is the Air Operations Net. It is always buzzing with a frenzy of activity. Day in and day out this seemingly routine function blankets the airman's world like air blankets the earth. And like air, it is so taken for granted it becomes conspicuous only by its absence.

If you asked an average airman how many flights the Air Force, the Army, and the Navy make a year—in terms of aircraft movements—you'll get a variety of adjectives like, "plenty," "fantastic," etc. Ask a busy AACS man involved with the Air Operations Network and he'll probably quote you an exact figure—if he can find the time. Last year AACS handled 15 million aircraft approaches, or about one every two seconds around the clock. This also included commercial aircraft which often utilize AIRCOM's facilities.

Statistics, impressive as they are, miss the human



This 172-foot Wullenweber antenna, measuring 500 feet across the center, plus myriad other single sideband transmitter and receiver antennae, increase the power of SAC's ground-to-air communications to 45,000 watts. At Elkhorn, Nebr., this Wullenweber is one of three in the entire Free World.



element inherent in each message concerning aircraft movements. AIROPNET's purpose is to insure safe and effective flight operations by expeditious handling of air movement traffic.

Flight plans, aircraft departures and arrivals, load messages, and other inflight data are delivered through this network. In addition, AIROPNET often furnishes the first information on overdue aircraft and carries the necessary alert messages to air rescue units.

Vital also, is the USAF Weather Network which last year handled eight and one-half million weather messages. Used primarily by Air Weather Service, the net provides data necessary for research, forecasts, and aircrew briefings. The information comes from global points in teletype and facsimile form, augmenting the national and international weather communications system of the World Meteorological Organization.

A new network of AIRCOM is the Combat Logistics Network (COMLOGNET). It provides communications for the Air Force Electronics Data Processing Equipment (EDPE) program. Since early 1954, the Air Force has used EDPE to improve management, conduct weapon support activities, and to effect economies. Current plans are to extend the usage of EDPE. COMLOGNET provides rapid, reliable, and secure data communications on a worldwide basis, employing fully automatic electronic switching equipment and high-speed trunk circuits for increased capacity and speed.

In addition to the foregoing networks, portions of the AIRCOM channel capacity are allocated to specific users on a full- or part-time basis. These users include the Joint Chiefs of Staff, unified and specified commanders, the Army, and the Navy. Circuits are always available for use by the White House, and on recent presidential trips official Washington was able to keep in touch with the chief executive through AIRCOM channels.

The tremendous volume of messages handled by AIRCOM requires the latest in equipment. Now operated in the Continental U. S., the Pacific-Far East, and Europe are 10 Air Force teletype relay centers which are fully automatic. Each of these centers can accept up to 200 messages simultaneously, segregate high from low precedence, scan one or more message addresses, route each message to the next relay of the addressee, and transmit to destination at speeds up to 100 words per minute. This speed is doubled for what communicators call "across the office" delivery, which means moving the data from receiving units to transmitting units within one center.

Channel to Tomorrow

It would be a fallacy to create the impression that AIRCOM or other branches of communications-electronics have reached full capability or attained the stature needed to do the job through the foreseeable future. There is a three-phase modernization program presently underway. The first phase is to improve existing communications networks by modifying stations approaching obsolescence. Phases two and three fall into the realm of long-range planning through 1965 and beyond.

Tailored to the specific future needs of Air Force space weapons, the program has a number of goals such as increased data handling capacity in speed and uniformity, increased short and long haul "voice" handling capacity, etc.

Prominent in the period through 1965 is *Project Midas,* the satellite early warning system. It gets its name from *Missile Defense Alarm System,* and it will employ infrared detection techniques. By sensing heat radiations it will be able to detect missiles almost immediately upon their launch. Tied in with an improved Communications Complex, MIDAS should provide added precious seconds to our warning time.

As General LeMay has said, when the difference between the life and death of a nation depends on minutes, and every micro-second counts, the need for a more than merely adequate warning, communications, and control system is imperative. This means increased speed, capacity, and reliability. The latter is paramount, but unfortunately, a slippery eel to hold. For years, a 99 percent efficient circuit was considered to be the top goal. But today, the remaining one percent circuit failure (which amounts to 14.4 minutes per day) coin-

cides grimly with the countdown time of an ICBM, the alert time of SAC and TAC, and the warning time we expect from BMEWS.

Consequently, communications relies on multiple independent paths between points where the greatest reliability is required. By introduction of redundancy in information for cross-checks for error, the nebulous goal of a 100 percent reliable system can be approached. Even so, multiple means will probably always be employed to take care of unforeseen events which could knock out parts of the system.

One of the more promising improvements are communications satellites which have almost unlimited potential. One difficulty in their development and use, however, is the need to build long-life and reliability into them. It will please maintenance men to learn that no plans are afoot for isolated duty berths aboard these orbiting units, but at the same time, this compounds the problem of keeping them in commission. Further, booster costs are so high the satellites cannot be replaced often.

A big advantage of such a satellite with several channels of communication in polar orbit would be added control of strategic aerospace forces in this critical area. Classical communications in arctic regions do not have the required reliability, while construction and maintenance are both difficult and expensive.

It would indeed require many literary brushes and canvases to paint in infinite detail the drama of communications-electronics as it is enacted every minute of every day in national defense.

One would, in fact, be at a loss for a place to start, because integration is so nearly complete it would be like hunting for the beginning of a circle. Surely, however, a point of departure can be found in the arctic regions where silent and unseen, radar beams of BMEWS stations will soon sweep in ceaseless vigil across the top of the world. Their radiations will speed swiftly at 186,000 miles per second, probing for objects alien to the serene polar horizons, feeding the spurious and extraneous "noise" returns of the area into complexes of special-purpose computers. The computers are designed to analyze the radar echoes, detecting those which betray the presence of potential missiles, estimate them and feed them to other computers for further analysis.

Should the ponderous hulk of an ICBM lift from its launch pad to arc toward an impact on targets in the United States, the computers would calculate—at the rate of 200,000 mathematical operations per second—the missiles course, target, and impact time.

90 Seconds and Go!

The U. S. Air Force, its strategic, tactical, and defense forces poised interminably for take-off within minutes, can allow communications only 90 seconds to perform its job. The balance of SAC's 15-minute life-or-death posture is needed to get its crews airborne. Every few seconds beyond the alloted 90 that communications takes to spread its word means one less aircraft off.

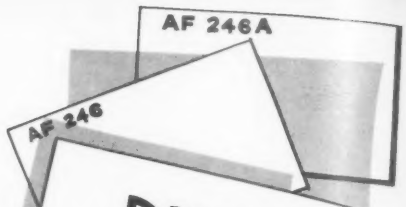
What happens in that first minute and a half? Within a few millionths of a second, signals speed from BMEWS sites to display centers where electronic data are converted into readable information appearing on scopes and panels, triggering bells and klaxons in smoky alert rooms, kicking to life the fantastically intricate computers and electronic brains of SAGE units, jangling hot lines in command posts throughout the Free World, centering in NORAD'S central combat operations center, and finally, inevitably, emerging as a terse, vocal utterance into the ear of the President of the United States.

As bombers and fighter-interceptors roar skyward, and missile crews run countdowns then hunch tensely over firing buttons, the President makes his decision. Whether the bombers continue to target areas and ICBMs fire, will depend upon that decision—the gravest, most difficult ever confronting a human being.

But what of the millions of Americans who only seconds before were living daily, routine lives? Across the nation the drama with the life-or-death ending is unknown only for a few seconds. Then, because of communications-electronics, the warning that will save countless American lives begins as ominous eerie wails of civil defense alarms. As tight voices of announcers impart their messages over CONELRAD frequencies, it becomes clear to everyone.

It is happening.

Chronicle of the Cards



A satire[1] on how some things get fouled up—with footnotes.

by Capt. N. A. Parker, *NCM*[2]

As one of the 30,000 card carrying[3] coffee drinkers at the Pentagon, I am subject to the smoldering vituperation of that mass of green-eyed monsters known as The Field. In happier days I belonged to The Field and I know whereof I speak, because I have cast my share of aspersions at the sanity of the people who preceded me here. But now I am crusading to promote better understanding between the "good guys" in The Field, and the "bad guys" in the headquarters.[4] The project recounted here is intended to illustrate that headquarters types have problems too.

Many years ago an inspired genius designed a form called the "Record of Emergency Data." It was a dandy, and after only months of coordination it got printed as a Department of Defense form. (The Department of Defense usually prints forms for which there is a common need among the services.)

This DD Form 93 (as it was quaintly nicknamed) served the purpose of the services admirably. I have not had the pleasure of being on interservice committees, so I don't know what the Army or Navy did with theirs, but in the Air Force, the DD 93 was made up in triplicate or quintuplicate about a million times a year. The Field kept their copies in the unit personnel records, and sent a cardboard copy of the form for file in Headquarters USAF. The people in Hq USAF, with industry and energy, filed these into a battery of soundex machines. Whenever someone overseas became ill, injured, or dead they pulled out his card and notified his relatives. When somebody made a new card, it was filed and the old card was thrown away. This system worked fine for a number of years, but then The Project began.

Sometime in 1956, a member[5] of the Casualty Branch asked "Why don't we file Records of Emergency Data by machine and save the cost of keeping

A statistical expert was consulted.

[1]A satire is a true story written so everyone thinks it's fiction.
[2]Non Compos Mentis.
[3]This is a poorly made card which is not laminated and cannot be used to scrape windshields on frosty mornings.
[4]Headquarters people think they are the "good guys," but we know better.
[5]At least five people claim this distinction so we won't name names.

several filing clerks on the payroll?" The question was mulled for several months and the answer was, "Why not?"[6]

A statistical services expert was consulted, and he contracted to design a card. Now, over the years the Record of Emergency Data had grown somewhat,[7] and it was found out that you couldn't hardly fit both sides of a five by eight card on to one side of a three by eight card. This was just a minor problem though, and was solved within a year. The result was a tentative form similar to the present AF Form 246. Information contained on the form was separated into two categories. Everything that was needed right away was listed on the punch card part of the form, and the rest of the required information was continued on sheets of paper to be filed in unit personnel records. The Project was then put under study.[8]

When everybody[9] was satisfied that the new form was indeed an improvement, it was given a test run. AFR 35-38 was rewritten, and about 10,000 test forms were printed. The project was dumped into the lap of the Air University, which passed the regulation and the new forms to ROTC units throughout the country and to the schools at Maxwell AFB. Soon completed punch cards started piling up. Machine operators at Maxwell punched in the serial numbers and filed the cards. They ran the cards over and over to see if they would wear out. When no major problems developed and the cards stood up to several years of test use, they placed their stamp of approval on The Project which was then tabled while everybody associated with it rotated overseas.

It was now the Fall of 1958. Only the routine of coordinating the new regulation remained. Since this required no creative thinking, the newest and most eminently qualified member of the Casualty Branch got the job.[10]

[6]Not Dayton Allen.
[7]Hasn't everything?
[8]In specially built desk drawers.

Since the whole idea of The Project was based on simplifying work for everybody, there was obviously no panic about getting the new form into action overnight. At first, 12 months appeared to be a reasonable time to convert to the new form, but cooler heads prevailed and it was decided to allow 18 months. The first six months, July thru December 1959, were allotted for slippage. The whole year of 1960 was set aside for gradual transition to the new form. In June the shiny new regulation (but only a few of the forms) hit The Field and that same month, the first completed form reached Hq USAF. That card and the dozen or so that followed in the next week were run thru the IBM machines until their corners were scorched.

When July began, four manning document spaces were cut out of the Casualty Branch, because the machine filing system was going to save at least that much manpower. Unfortunately, this cut didn't allow for the fact that the old DD 93s were still coming in. In August and September we got as many DD 93s as we had ever gotten in any other two-month period. We also got about 25,000 Form 246s. The hard working troops of the Record of Emergency Data Unit screwed their eyeballs tighter and worked a little harder. By October the madness was still continuing, so a form letter started going out of Hq USAF asking The Field if it had ever heard of, or seen, the revised regulation, or new form. It was then that a lot of bases finally got distribution of the new form.[11]

The publications people, meanwhile, were egging the printer for another few hundred thousand forms. By December, a new batch was printed and ready for some more distributing.[12]

When January 1960 rolled around almost 2,000,000 Form 246s had been printed and distributed, and still the DD 93s kept coming in. We started sending them back, and now a lot of people are mad at us. The feeling, we would like to point out, is somewhat mutual.

Yet although we're cantankerous about The Project we are also considerably wiser. Last July the unit personnel section of Hq USAF was given some of the test Form 246s, and the ladies working with the form were asked how they liked it. They hated it. "The DD 93 was a better form," they said. We pointed out that with the new form the typist could save 10 seconds just because everything was printed on one side and there was no need to take the form out of the typewriter and reverse carbons and reinsert. We told them that with the 246A, they could make simple corrections and additions without having to retype the whole form. We showed them that there were no new items and that things were not rearranged to any spectacular degree. They still hated it.

It was December by the time anyone got up nerve enough to ask them again about the new form. By that time it wasn't too bad, and they were happy that we had followed their suggestion in making the spaces

[9]The boss.
[10]Me.
[11]They walked over to base supply and picked them up.
[12]We wanted to hand carry them to the units but they wouldn't let us.

between the lines larger. No one remembered that suggestion in the Casualty Branch, and the spaces between the lines certainly hadn't changed, so this proves that the age of miracles has not passed.

We learned that certain units of The Field have initiative. Two of the bases, pretty far apart and in different commands, printed up their own forms. This would have been a marvelous idea, except that the punch cards they printed were on the wrong grade of paste board and jammed every machine we tried them in. It broke our hearts to send these back.[13]

We discovered that Personal Affairs Sections are loaded with rugged muscular individualists. They can wrap a rubber band so tightly around a package of cards that it saws halfway through. The individualists sneer at the rules, and must figure that people don't know their AFSC from their AFSN. Thus, we get service numbers that contain nine or ten digits. We get yellow sheets instead of punch cards. We get yellow sheets along with punch cards. We get blank punch cards. We get cards that have names reversed. Once we even got part of somebody's lunch.

Right in our regulation it says be careful with the punch cards. The punch card itself contains that old Chinese maxim *"Do not fold, staple or mutilate."* This was a mistake. People took it for a dare. Some of them stapled the cards in a dozen places just for kicks. When these go thru the IBM[14] machines the error lights shine like a Christmas tree. Other people use a two-hole punch and, as if that weren't bad enough, they use a very special two-hole punch that leaves scars about the size of .50 calibre bullet holes. Sometimes, maybe three digits of an eight-digit service number are all that are

[13]We laughed for days.

[14]You are not really supposed to mention trade names like "IBM" in an Air Force magazine because it invites payola. So I say now, "IBM, if you intend sending me one of your machines for the free advertising—please don't!"

left to work with, but that doesn't really matter because, if there are punch holes, the card is worthless anyway.

We also have a lot of conscientious people who seem to be fascinated with the new form. They keep redoing the card whether it needs it or not. This was fine in the first few weeks but, believe us, the hard workers of the Record of Emergency Data Section have had all the practice they need.

It looks like other uses have been found for the punch cards too, because every once in a while we get some that look like they were used as playing cards, markers in a crap game, cookie cutters, coasters, or blotters.

Then we also found out that there are many thrifty people who save old regulations. Ten years ago the regulation said that you sent the headquarters copy of the Record of Emergency Data to personnel services. That ain't so any more. It hasn't been so for a long, long time, but some of the cards still get sent to the wrong place.[15]

Lastly, we learned that there are blank check signers; characters who sign off their form without reading it. Their service number is wrong, their dependents' names are misspelled all the way to illegibility, their birthdates are listed in 1960. They don't seem to care, but we do!

We didn't expect everybody to read the regulation, and we didn't expect anybody to read it for entertainment, but we did want the people handling Records of Emergency Data to do more than file it away. It is printed on the finest non-allergenic, non-cancer producing paper we could buy. Nothing printed in the regulation is against anybody's race, creed, or nationality. It is a nice little regulation in its own way. Handle it once in a while.

[15]Send old regulations to the inspector. He likes them!

The Pilot Went Along for the Ride

by Dave Karten, Airman Staff

"It was like riding in the back seat of a limousine with a TV set while someone else did the driving."

That's how Maj. Frank Forsyth describes his ride in the world's smartest airplane, a U. S. Air Force F-106 *Delta Dart* all-weather interceptor that recently flew itself nonstop across the continent from California to Florida.

The 2,500-mile flight was the longest ever made by an interceptor aircraft without refueling. No attempt was made to set a speed mark, although the Convair-built F-106 holds the world's record of 1,525 miles an hour, set last December at Edwards AFB, Calif.

Major Forsyth, AMC's chief acceptance pilot for the F-106, took the *Delta* interceptor off the Palmdale runway at 8:48 a.m. Pacific Standard Time on Wednesday morning March 23. He held the controls until the plane reached about 1,000 feet. A minute later the *Delta Dart* picked up an electronic signal from the ground, and he took his hands from the controls. The F-106 then flew itself to Jacksonville, Fla., by automatic navigation.

The all-weather interceptor, built by Convair for the Air Defense Command, was equipped with external fuel tanks for the initial leg of the journey. They were jettisoned over the Air Force firing range at Yuma, Ariz.

Key to the fully automatic flight was the Hughes MA-1 navigation and fire control system designed to fly the aircraft through all phases of an intercept mission from shortly after takeoff to touchdown.

Before the F-106 took off, engineers preprogrammed its entire flight profile into the MA-1 system's Digitair —airborne digital computer. It included such information as route, altitude, and fuel available.

With this data and continuous range and bearing information flashed to the speeding aircraft by TACAN (tactical air navigation) stations across the country, the MA-1 system automatically compared the jet's position to the prescribed route and supplied signals to the airborne flight control system. It automatically corrected headings and altitudes.

"All I did," said Forsyth, "was flick a couple of dials to set up new maps on the horizontal situation indicator screen as we passed from one station area to another."

Signals from each new TACAN automatically projected new 400-mile-diameter maps on the tactical situation display screen. These signals tuned the interceptor's radio receiver to the proper wave length and informed the computer which map was being displayed.

Throughout the flight the F-106's precise position, in relation to each control station, specific way points, mountains, air bases and cities, was indicated on the screen by a constantly moving symbol of the interceptor. The symbol was positioned by the computer, which in turn navigated by reference to the TACAN signals.

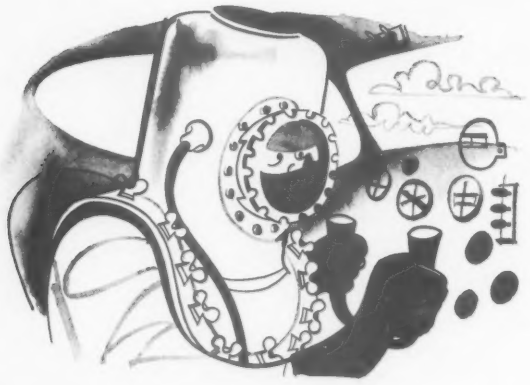
Though the flight was fully automatic, Major Forsyth could have overridden the automatic system at any time.

In combat operations the MA-1 system would take the plane—in all weather conditions—through climb-out to altitude and intercept heading, establishing speed and angle for an attack with atom-tipped *Genie* rockets or HVARs. It would control the attack run, launch the missiles, break off for the return to base, navigate home, and set up the landing approach.

Major Forsyth again took over the controls for a landing.

Flight time for the F-106: 3 hours 17 minutes to Jacksonville.

Flying time for the pilot: about five minutes.



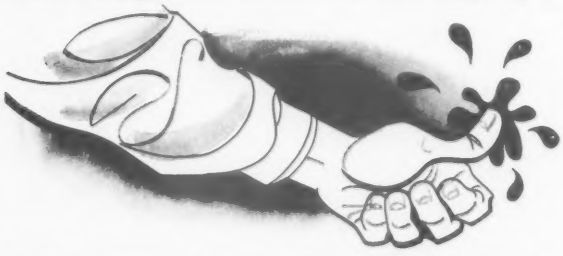
perils & plights of pilots

by TSgt. Harold L. Craven, *Airman Staff*

FLYERS are ingenious people. There are many instances on record in which quick thinking and ingenuity have helped airmen save lives, airplanes, and face. Once a portion of the late Wiley Post's face saved his life and provided an unexpected guest of honor for an Indiana National Guard squadron.

Post was making his third attempt to set a new coast-to-coast stratosphere speed record. Somewhere over Ohio an oxygen valve failed, causing excess oxygen to fog the glass window of his stratosphere helmet. Removing the helmet was a two-man job and he couldn't get his hands inside, so he solved his problem by using his nose for a windshield wiper. A short time later he landed at the Lafayette Airport on the Purdue University, stiff-necked and numb-nosed, in time to be guest of honor at the weekly training session of the 113th Observation Sq., Indiana National Guard.

A Colorado National Guard pilot, Lt. Ralph Hall, once credited his observer's thumb with saving him from a dangerous landing. The year was 1927 and by order of the governor the two men were observing at



low altitude an outdoor rally of the International Workers of the World.

Suddenly the tachometer plug came out of the engine's camshaft housing, permitting oil to escape rapidly. Hall could tell by the way the IWW members below were shaking their fists that they wouldn't greet him cordially if he landed near them. He also knew that loss of all his engine oil would make flight to another safe landing area impossible. While contemplating his plight he saw his observer, Lieutenant Wilson, move rapidly past his cockpit and make his way toward the engine. Seconds later Wilson thrust his thumb in the oil leak and held it there, enabling Hall to fly to a better landing point some 30 miles distant.

LOSS OF OIL in flight is one thing. Forgetting to service an airplane before takeoff is another. A student enrolled in the World War II War Training Service flying program failed to put oil in his light plane prior to takeoff and was embarrassed by engine failure shortly thereafter. There was a hayfield ahead, just beyond an apple orchard, and the student decided to glide the little plane to a landing between two haystacks. He overestimated the gliding ratio of his airplane, however, and lost flying speed before he reached the field. The plane came down in an apple tree and was impaled on its branches. The student climbed down the tree and started walking back toward the airport, then remembered that his instructor had told him to put oil in the engine. He had forgotten to do it.

"I'll be flunked out for sure," he told himself, "unless I loosen an oil line or a drain plug or something. If the instructor thinks it was honest mechanical failure, maybe I'll get another chance." He walked back to the apple orchard, climbed the tree, and went to work on the engine. He didn't see the instructor's car arrive on the scene. The student was duly washed out of the flying school. He joined the merchant marine on the following day and served as an oiler until the war's end.

A few days after the apple tree incident the errant student's instructor faced his own moment of truth. The engine on his own private plane failed shortly after takeoff and he committed the unpardonable error of

making a low speed, low altitude, downwind turn, back toward the runway. Somehow he made it, with inches to spare, and was startled to see another airplane roaring up the runway toward him. The plane cleared him by 50 feet or less and he sat there a moment, shaking uncontrollably. In a minute or two he managed to regain

his composure. Then he noticed a group of students standing near the hangar watching him. They were his students and he had told every one of them, many times, never to make a graveyard turn.

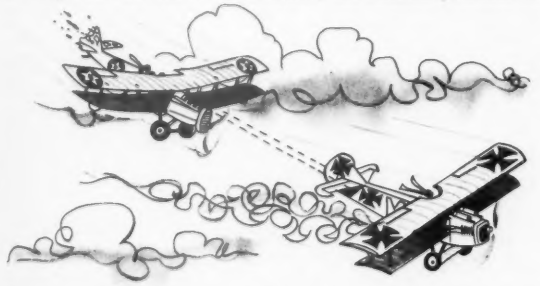
"If you lose power on takeoff, land straight ahead. A crash landing under control is safer than an uncontrolled crash," he had told them.

He touched the self-starter button, hoping the engine would catch hold. After a few turns of the prop it came to life. He taxied back to the hangar and faced his students.

"Gentlemen," he lied, "I have just risked my life to show you the evils of a graveyard turn. If that maneuver had been unintentional I surely would have been killed."

With that he turned abruptly, entered the main office of the flying school, sat down at a typewriter, and typed his letter of resignation. He had saved face with his students but not with himself.

NO ONE likes to lose face, but losing part of your tail in midair can be even more embarrassing, as one observation pilot discovered while flying over enemy territory. *Air Service News Letter*, the official journal of



the Air Service following the first world war, described a mission in which German antiaircraft fire destroyed most of the tail surfaces of an observation plane and ripped a large hole in its fuselage.

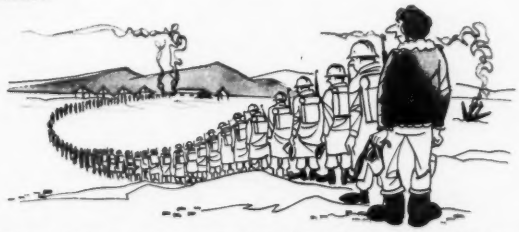
The airplane fell into a dive and the American pilot, a Lieutenant Bonnalli, fought to regain control. He reduced the angle of descent somewhat, but found level flight impossible. He glanced back at his observer, a British officer assigned to him on a one-flight basis, and saw him pointing at something. Bonnalli looked and saw another drama unfolding some distance below. An Allied observation plane was being followed closely by a faster, more maneuverable, German pursuit plane.

Forgetting his own plight Bonnalli relaxed his pressure on the stick and let his crippled plane dive almost vertically, hoping to get on a collision course with the German machine. Seconds later the enemy plane was in his sights. He squeezed the trigger and the target exploded. Then he tried again to get his own plane's nose to move upward, toward the horizon.

They were lower now and the air was more dense. The remaining portion of the elevator seemed to have more effect than it had at higher altitude and the steep dive became a shallow one. Achievement of level flight, however, appeared to be impossible, and a crash landing in German territory seemed inevitable. Suddenly the plane's nose moved upward, above the horizon line, then dropped back to its normal level-flight position. Bonnalli looked back in amazement and found his observer sitting on the fuselage, cowboy fashion, midway between the rear cockpit and damaged empennage.

"Let's go home, Old Man," the observer yelled.

Bonnalli managed to turn the plane toward Allied lines. His observer, by shifting his weight backward and forward, helped him maintain level flight all the way back to their home base. The British officer remained at his post throughout the approach and the landing, and both flyers walked away from the wreckage unhurt.



ONE WAR LATER another American pilot, flying a Lockheed F-5, the photo reconnaissance version of the P-38 *Lightning*, had his airplane shot apart by German fighters over enemy territory. When the plane fell out of control the Germans left the scene and the American left his cockpit.

Blessed with sufficient altitude and favorable winds the American flight officer managed to steer his parachute to an encampment of the ground forces of a friendly European nation. Inasmuch as he hadn't eaten breakfast prior to his mission he cut himself loose from his 'chute and joined one of the longest chow lines he had ever seen in the field. This turned out to be a mistake, for when he eventually reached the serving line and identified himself he was turned away. It was an enlisted men's chow line.

Episode on Terceira

The wound from a wild bull's horn almost took his life, but Pinta Silga found a benefactor -- and a new name.

by TSgt. John K. O'Doherty, *Airman Staff*

THIS SEASON considerable numbers of Americans will attend the bullfights at Angra do Heroismo on the island of Terceira in the Azores. MATSmen from nearby Lajes Field and tourists from the mainland will mingle with the throngs of enthusiastic Portuguese as the excitement, glamor, and pageantry of the afternoon contests progress to electrifying climax. Oddly enough, at some of these performances the roaring, cheering voice of the crowd will shout the name of an Air Force captain as the matador gracefully swirls his cape in the face of one of the famed wild bulls of Terceira.

As a normal, red-blooded young American from Mooreland, Okla., Tony Kammerlocher holds no intense opinions about bullfighting one way or another. This is to say he neither approves or disapproves; he can take it or leave it alone. But as Air Force veterinary officer assigned to Lajes Field—a position calling for intimate contact with the civilian population— it was inevitable that Captain Kammerlocher should become acquainted with some important people associated with bullfighting. On the island of Terceira bullfighting ranks high—along with romance—as a national sport.

Shortly after his assignment to the island as station veterinarian for the Azores Air Transport Station, Captain Kammerlocher formed a warm friendship with Dr. José Leal Armas, a distinguished citizen of Terceira and professional veterinarian representing governmental interest in matters pertaining to animal husbandry. The two found a great deal in common as they discussed the problems of the island with respect to sanitation, food supply, and agricultural progress. They compared techniques and points of view held by European and American practitioners of veterinary medicine. In due time Captain Kammerlocher found an opportunity to do a service for his friend by successfully performing Caesarian surgery on a valuable cow, and from this incident grows the story.

Dr. Armas, highly impressed with the technique demonstrated by his professional colleague, made no secret of the incident and in this agricultural community the news soon spread through the length and breadth of the island.

Shortly thereafter, Dr. Armas relayed a courteous request from a prominent landowner of Terceira, an aristocrat of the island and a breeder of fighting bulls. Could the American captain be persuaded to examine an injury suffered by a promising young bull, Pinta Silga, a bull bred for the arena and scion of a long line of animals which had distinguished themselves through generations of fighting? From the condition of his injury it appeared that the career of Pinta Silga was ended before it had begun.

Now bullfighting among the Portuguese—to coin a delicate phrase—is a horse of a different color entirely from the sport that is practiced in Spain. The bulls are just as fierce, and the matadors equally colorful and glamorous. Audiences reach heights of enthusiasm comparable with anything seen in Barcelona or Madrid. But

in the Portuguese arena, the bull is not killed; this is forbidden both by custom and by law. The matadors of Portugal and the island of Terceira are judged by their courage and the artistry of cape work; the toreador is measured by the skill of his horsemanship.

But Portuguese bullfighting, by the same token, is anything but a pantywaist parlor game. Broken arms and legs are frequently sustained by the human protagonists, and it is not uncommon to hear a bull admiringly described as a "three arm, five leg" animal, this being a capsule summary of his accomplishments.

Captain Kammerlocher found the injured bull in a small field enclosed by low stone walls. Senhor Parreira, gentleman farmer and sportsman, explained that Pinta Silga, though still a young animal, displayed unusual promise as a fighter—until the tragedy of his injury. The captain's diagnosis was swift, accurate, unoptimistic. Pinta Silga had been severely gored in the side by another bull, causing—in addition to the severe laceration— a hernia of the stomach wall followed by infection extending deep into internal tissue.

Surgery was indicated, without question, but the circumstances were hardly favorable. There was no building available, and none of the elaborate provisions for antisepsis found in a modern veterinary hospital. The only equipment was what the captain carried in his medical field kit, and even the restraining straps normally used in heavy animal surgery were missing. Captain Kammerlocher was aware as he rolled up his sleeves that the faculty back at Oklahoma A&M would probably shudder in disapproval, particularly as a thin penetrating rain began to sweep down from the hillside.

The proceedings began with the administration of a generous dose of tranquilizers to Pinta Silga. A couple of field hands were summoned to hold his legs. Mrs. Kammerlocher—a trained nurse long since inured to the double jeopardy of marriage to an Air Force officer and a dedicated veterinarian—laid out the equipment to be passed to her husband from the safer side of the waist-high stone wall. The surgeon knelt on an outcropping of lava, wiped rain from his face and bent to work.

In simplest general terms the operation consisted of removing the infected portion of the abomasum, or true stomach, cleansing the laceration in the animal's side, and finally closing the wound. All went well for a time as the combination of tranquilizers and local anesthetic dulled the senses of the bull. But just as the suture was completed, Pinta Silga decided that he had had enough. With a mighty lurch the bull struggled to his feet throwing the field hands aside like sticks. Then with flaring nostrils and head lowered, the patient charged at the surgeon.

Thanks to the agility of youth, Kammerlocher escaped over the stone wall while the farm hands fled in another direction. Pinta Silga had the field to himself, but the little group outside the wall watched in dismay as fresh blood oozed from the torn stitches in his side.

Senhor Parreira, though disconsolate, was content to accept the outcome philosophically as a worthwhile effort that failed. But Kammerlocher refused to give up so easily. A day or two later, with Pinta Silga in a more cooperative mood, he succeeded in replacing the suture—this time with stainless steel wire.

In the weeks that followed Captain Kammerlocher and Senhor Parreira shared the satisfaction of watching the bull return to full health and strength. And as Pinta Silga once again became a promising candidate for distinction in the arena, Senhor Parreira's gratitude continued to grow. When the captain courteously but firmly declined to accept a fee, the patrician offered gifts which were refused with equal politeness. Honor and tradition demanded that some appropriate expression of thanks be extended, but the only compromise offered by the captain was "Send me a couple of tickets to the bullfight sometime."

Like a flicker of light, this gave Senhor Parreira his inspiration. "Very well, the bull Pinta Silga is no more. Henceforth his name is Kammerlocher, and as Kammerlocher he will fight in the arena this season." And so it was decided.

There is a fiesta scheduled to coincide with Kammerlocher's debut in the ring, and one of the foremost matadors from the mainland of Portugal will pit his skill against the hope of Terceira. At the same time a ceremony in the arena will salute with typical Portuguese flourish and fanfare the accomplishment of a modest Air Force captain.

That is the story. Undoubtedly Hemingway with his broad experience in such matters could have told it more dramatically. But with Hemingway—inevitably—tragedy would have triumphed. Kammerlocher the bull would have died under the surgeon's knife, or Kammerlocher the surgeon would have been gored on the horn of his patient. As the facts stand they comprise a pleasant picture of a good deed well done, and a small but significant contribution to international friendship and understanding.

Senhor Parreira, owner of the herd of fighting bulls, and Captain Kammerlocher look over the animals. The photographer—wisely—refused to go any nearer.

How our writing program should work

For a Composer of Wri

a. Before writing, talk the project over with your supervisor or reviewer. Then you will know the emphasis he wants.

b. Reread your communication before turning it out. Don't depend on the typist or supervisor to correct your punctuation, grammar, and spelling.

c. Don't sulk about chang
Talk them over with the m
who made them. Try
understand his viewpoi

For a Reviewer of Writ

a. Don't make changes in a communication just for the sake of change. Don't be a nit-picker. Back up your change with a reason.

b. Make sure the composer understands why you have made the change.

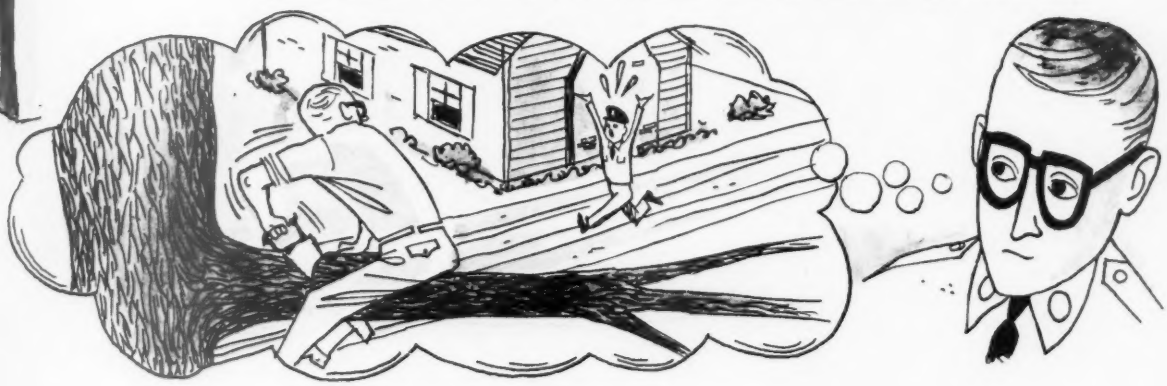
The Air Force Effective Writing Program has produced varying points of view on how to put the training into actual practice. To clarify this, here are some pointers a supervisor (one who reviews the writing of others) or composer (one who writes a communication) may use for self-appraisal.

Adapted from *TIG Brief*, No. 8, Vol. XII, 15 April '60.

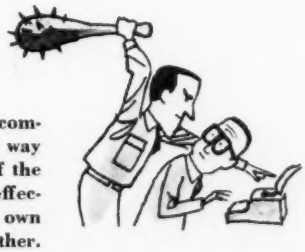
Written Communications

d. If you constantly complain about a supervisor changing your wording to his own, remember that: A good way to ease this problem is to write so clearly that anyone would be proud to say he wrote the communication.

e. Be grateful for the times your supervisor saved you from making a serious error.



Written Communications



c. Whenever possible, suggest the changes to the composer and let him do the revising.

d. Never insist that the composer write in your style or way of putting words together. If the composer is ever to write effectively, he must develop his own way of putting words together.

e. Discuss the communication with the composer before he writes it. Plan it together.

From Back Issues

Sir: In rereading the article *Monkeys, Mules, and Mynahs* (Dec '59), I noted that an error crept into your terminology. The mascot at Karamursel AS, Turkey, is not named Ashek. as you indicated, but Candy-Do in honor of the organization's motto "Can-Do." Also, you indicate that she is a mule. This too is incorrect. Candy-Do is a donkey, and Asek, not Ashek, is the Turkish word for that designation.

A/2C William Freeman
APO 294, New York, N. Y.

• *For those inclined to shrug this off with "a rose by any other name," there are several major differences. Most prominent—mules are hybrids and donkeys, purebreds.*

Sir: I was reading through THE AIRMAN of last September recently and noted your story *Mission to Plumtree*. In it, the rendering safe procedures for a 250-pound practice bomb, containing a ten-pound spotting charge, were described. The author noted that the sergeant tamped three blocks of C-3 into the fin of the bomb. This seems to me to be a dangerous practice. I think that one block of C-3, placed on top, over the spotting charge, would have been sufficient.

A/2C William Wells
Eielson AFB, Alaska

• *The article in question was an account of a mission as it occurred, and was supplied to us by an author who had witnessed the destruction. Not being fully cognizant of proper procedures in such instances, the editors hardly feel qualified to pass on the safety of the measures utilized. However, in an earlier article on the same general subject,* (They Outsmart Death, *Dec. '58), it was noted that judgment and training were absolute "musts" in EOD work. Consequently, the editors assume that in the judgment of the EOD man, this case called for the added C-3 blocks and the fin-section was the logical area in which to place them.*

★ ★ ★

Retrograde—to Us

Sir: In *Slants on Space* in the March issue, you note that the five satellites of Uranus have a retrograde or backward motion. This is only apparent since Uranus itself revolves on its axis in a retrograde or clockwise direction. Therefore, the motion of its satellites is retrograde only when compared to most other bodies in the solar system. With reference to their own planet, the motion is direct.

SSgt. Thomas Berry
Forbes AFB, Kans.

• *Bill Kinney, our* Slants on Space *author, was quick with his praise of the apparently extensive knowledge of Sergeant Berry with regard to the solar system. As he points out, it is seldom that people recognize the fact that Uranus is a maverick, rotating in a direction opposite to that considered "normal." However, it is because of this "normalcy" that the satellites of Uranus are considered to have retrograde motion. As the earth is the platform from which astronomers have made their observations, and because its rotation is eastward, standard usage has decreed that planets and satellites rotating in a direction opposite to ours shall be designated as being retrograde in their motion. Uranus and its satellites so qualify. Congratulations, however, to Sergeant Berry for his very sharp observation.*

★ ★ ★

School Founder

Sir: In your June issue, you ran an item *(Airman's World)* regarding the efforts of SSgt. Bart Azzaro and his wife in the founding of a school for the visually handicapped in nearby San Bernardino, Calif. I would like to cite the efforts of Maj. Ronald Braley of this station who was instrumental in founding a similar school in Riverside in 1958. We think the energetic projects of these two men are glowing examples of the fact that airmen in this area take more than average interest in local community problems.

Maj. Craig S. Powell
March AFB, Calif.

★ ★ ★

Well, Short Tons

Sir: I have just completed *The Air Force in Latin America* (March) and noted that the claim is made that in 1958 the courier fleet carried 687,700 tons of freight and passengers to various destinations. Are you sure these figures are correct? They seem abnormally high to me.

Thomas D. Woodward
Long Island City, N. Y.

• *Reader Woodward is quite correct. While the figure 687,700 is right, the designation should have been pounds, not tons.*

★ ★ ★

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A TOUCH OF THE AIRMAN'S WORLD

It is not uncommon to see a copy of THE AIRMAN tucked in the knee pocket of an aircrew member's flying suit. That it would ever become recommended reading for paratroopers enroute to a jump was, until now, a possibility bordering the fantastic. Yet here is proof that at least one 101st Airborne Division paratrooper considers THE AIRMAN to be relaxing, pre-jump reading. The maneuver was Operation QUICKSTRIKE, a joint Air Force-Army exercise. The alert photographer was A/1C William J. Parsons, Shaw AFB, S. C.

AIRMAN'S WORLD

People

COMBINED CONTRIBUTIONS of three well-trained airmen produced a truth-is-stranger-than-fiction adventure high in the air over the southwest recently. While on an evaluation mission, Capt. Boyd Clampitt lost control of the computer-bomb hairs on his B-47. Flying as a fourth man on the flight, the crew chief, SSgt. Edwin Jones, called a nearby aircraft he knew was carrying a bomb-nav specialist. Sergeant Jones outlined the problem and was advised the computer rack would have to be rewired. Together, Jones and Captain Clampitt tackled the job while the electronic specialist relayed instructions from the other aircraft. Despite some 600 parts and 200 terminal connections of the malfunctioning unit, the job was accomplished, mission completed, and aircraft safely returned to Davis-Monthan AFB, Ariz.

SUCH INGENUITY was also evident in many of the inventions reported in recent weeks.

From RAF Station Bentwaters, England, comes word that TSgt. Wayne Spaulding and A/1C Joe Swofford pooled their talents to produce an approach control simulator which is being used as an indispensable aid in cross-training GCA operators to tower operations and in increasing the efficiency of assigned tower operators.

Also in England, at RAF Station Woodbridge, A/1C Ronald Wiseman recently received a cash award for production of a "Bunny Suit" which is expected to save USAF several thousand dollars annually. Despite all precautions, many mechanics often fail to remove all metallic objects from their pockets when working in and near jet intakes. Loss of these objects into the intakes can cause severe engine damage. Wiseman's one-piece coverall-type suit, designed to slip completely over normal work clothes, even to the shoes, and to fit tightly around neck and wrists, eliminates this hazard.

At Dow AFB, Maine, TSgt. Winston Patterson checked in with a self-powered tow cart designed to move auxiliary power units in and out of the local maintenance shop. Powered by a DC electric motor which operates off six 24-volt batteries, the unit, dubbed "Magoo," was constructed from salvaged parts.

Finally, from Korea comes word that SSgt. Charles Waugh of the 314th Air Division has designed a new "cocoon" for *Matador* missiles assigned to that station. Previous covers, which protect the missile from the elements, were so bulky that it took a four-man team about 30 minutes to remove them preparatory to firing. The new one-piece cover can be removed by two men in 10 minutes.

BRIEFS

. . . A recent cargo-flight from Hickam AFB, Hawaii, to Travis AFB, Calif., marked a milestone for SMSgt. Aldo Branchini. During the flight, this 20-year veteran passed the charmed 10,000-hour mark as a crewman, a feat generally achieved by less than one percent of all engineers.

. . . TSgt. John Spears, Vandenberg AFB, Calif., recently climaxed a 17-year effort by attaining his PhD. During that period, he attended Long Island University, Histoubashi University, Tokyo, Japan, the University of San Francisco, Creighton University (which awarded his master degree), and the University of Southern California where he climaxed his educational search.

. . . Luke AFB, Ariz., reports it is hosting an unusual father-son team. The two are Lt. Col. Richard E. Freeman and son, Lt. James S. Freeman. The unusual aspect—both are undergoing F-100 training, Colonel Freeman to attain recurrency, his son to master the initial phases of the aircraft's operation.

. . . Few people attending a concert by the Springfield, Mass., Symphony Orchestra are aware of it, but one of the percussionists sports a daily job somewhat different from that usually associated with such musicians. His name is Ted Anderson, Jr. His job—captain, USAF, aircraft commander of a KC-97 refueling tanker at Westover AFB, Mass.

A/2C Raymond Santini is one of three USAF photographers with a novel job at Edwards AFB, Calif. Airman Santini is one of the team members charged with photographing the flights of USAF's X-15. His workshop for such missions is the rear cockpit of an F-104B chase plane. Santini and the other team members, A/1C Carson Lyons and A/2C Russell Fryan, have been initiated into the Mach One Club.

Events

A smooth blending of the old and the new have produced an interesting current news brew which ranges in scope from old aircraft to new newspapers.

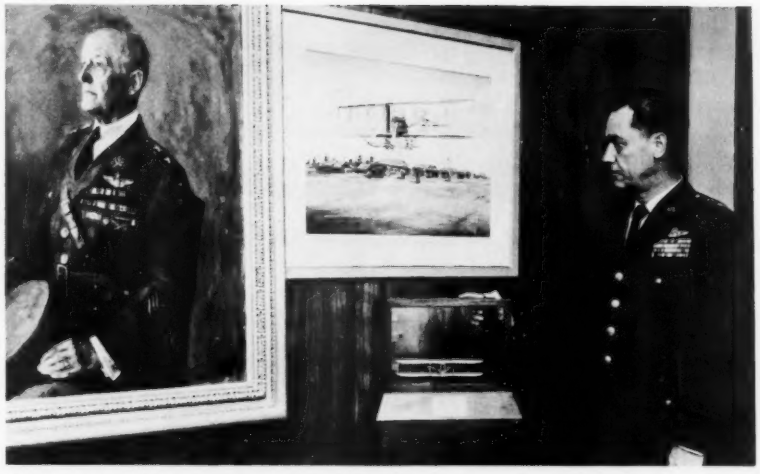
For example, the Air Force Museum has lost a display—but the United States and USAF have gained new prestige as a result.

Japan's equivalent of the *Wright Flyer* is safely back in Japanese hands thanks to Air Force efforts. First flown on December 19, 1910, the antique *Farman Voisin* biplane found its way into the USAF Museum at Wright-Patterson AFB, Ohio, as a war memento. But, as a gesture of friendship, American officials recently agreed to return the historic aircraft to the Japanese in time for the celebration of their 50th anniversary of powered flight. Consequently, it was dismantled, crated, and flown via an Air Force C-130 transport to Japan where it is being reassembled at Johnson AB for return to its original owners.

A hearty welcome is extended to *Data-Link,* Portland Air Defense Sector's new bi-weekly publication. Its recent introduction marks it as the first military newspaper in USAF to be distributed by a SAGE sector headquarters.

Travis AFB, Calif., scored a first recently when it announced installation of USAF's only C-133 B-model simulator. Capable of producing actual flight and emergency conditions for crew training purposes, the ground-bound cockpit has the advantage of allowing the trainee to make mistakes without endangering lives.

Farewells in widely scattered locations also marked recent USAF activities. In Kansas, Forbes AFB bid farewell to its B-47 combat-crew training facility with the graduation of the last class on June 20. The 90th Strategic Reconnaissance Wing and its subordinate units reverted to control of USAF, being replaced by the 40th Bombardment Wing. Future classes, which would otherwise have been trained by the 90th, will now receive their instruction at Little Rock AFB, Ark.



Maj. Gen. William B. Stone, USAFA Superintendent, recently accepted several new items for display in the Academy Museum. Included were an oil portrait of Maj. Gen. Benjamin Foulois, a water color of the Wright Model B, and a model of "Aeroplane Number 1, Heavier-Than-Air-Division, United States Aerial Fleet." Between March and September 1910, General Foulois, USAF's first "correspondence course" pilot, successfully completed 61 flights in Aeroplane Number 1.

And Iceland's Foreign Minister, Gudmundur Gudmundson, recently acknowledged the departure of the 53rd Air Rescue Squadron from Keflavik Airport with a letter of appreciation for the excellent job that organization had done during its eight-year stay in Iceland. The letter was addressed to the U. S. Embassy in Reykjavik.

Details on the development of Digitair, the amazing electronic computer which was utilized in the hands-off flight reported on page 17, were outlined in the March-April 1958 edition of THE AIRMAN. (See, *The Pilot Went Along for the Ride,* current issue.)

BRIEFS

. . . MATS recently announced the award of more than half a million dollars in additional contracts to civilian airlines. This boosts the total for such contracts during the past fiscal year and through September 1960 to nearly $90 million.

. . . Officials at the Air Force Academy recently accepted the Golden Gavel, a trophy emblematic of supremacy in service academy debate competition. Air Force Cadets were victorious over counterparts from West Point, Annapolis, and the Coast Guard Academy at Kings Point, N. Y.

. . . USAF officials recently announced that Air Weather Service crews had passed the 10-million-mile mark in Ptarmigan weather reconnaissance flights over Arctic wastes. Almost simultaneously, flying weathermen celebrated the 13th anniversary of operations.

Aerospace Library

Technical tomes have grabbed the spotlight this month in the area of new publications which should be important to the professional airman's library.

Charles Overbey, a leading aeronautical design engineer, has authored an *Aircraft and Missile Design and Maintenance Handbook*. It runs the gamut of problems, even into such areas as rust-proofing and plating. The MacMillan Co., $9.75.

Several American and German experts have pooled their talents to produce *Air Technical Dictionary: German-English*, an excellent compilation of terms peculiar to aviation research and development. It is being released simultaneously in Germany and the U. S. Duell, Sloan and Pearce, Inc., $10.00.

Finally, Philosophical Library has released a revised edition of *Electronic Computers* by T. E. Ivall, $15.00. Three new chapters have been added and other technical developments incorporated into the original text.

In the field of aviation history, Norman MacMillan, who authored *Great Airmen*, has produced a sequel titled *Great Aircraft*. Primarily British in content, the book also deals with such world-famous planes as the Wright *Flyer*. St. Martin's Press, $5.95.

Also in the historical category is *The Ocean of Air* by David Blumenstock. Basically it treats with the atmosphere, its scientific exploration, and how weather has influenced history. Rutgers University Press, $6.75.

In a similar category, though not truly historical, is *Window in the Sky: The Story of Our Upper Atmosphere* by Homer Newell. The material ranges from the troposphere through the exosphere and studies composition, radiation, and other phenomena of the various altitudes. Whittelesey House, $3.00.

Other interesting recent titles include *The Story of the U. S. Air Force Academy*, MSgt. Lawrence Landis, (Rhinehart, $3.95); *It's Your Life, Joe: An Expert's Advice on Air Safety*, Col. A. M. Henderson, (Vantage Press, $2.95); *Atlas: The Story of a Missile*, John Chapman, (Harper, $4.00); *Man's Reach Into Space*, Roy Gallant, (Doubleday, $3.50); *The Missilemen*, Mel Hunter, (Doubleday, $4.95); *War for the Moon*, Martin Caidin, (Dutton, $4.95); *Strategy in the Missile Age*, Bernard Brodie, (Princeton University Press, $6.50); and *IGY: Year of Discovery*, Sydney Chapman, (University of Michigan Press, $4.95).

You Ask It

Q. What is the long-range outlook for temporary promotions in commissioned grades under the provisions of the new temporary-promotion system?

A. Personnel officials anticipate that temporary promotions may now be continued indefinitely.

Q. In connection with this same program, why was ACS used for Reserve officers?

A. Because they do not have an exact equivalent of PLS and this is the closest acceptable parallel.

Q. When I am discharged next month, I will be eligible for a Korean Bill GI home loan. Will I lose this eligibility if I reenlist?

A. No. However, you'll be bound by the same deadline as any other veteran.

Q. Is there an Air Force publication which describes eligibility requirements for the missile badge?

A. Yes. The latest revision is AFR 35-5, dated 24 February 1960.

Q. My husband recently died leaving me a few minor bills which I intend to pay. However, several of the creditors have threatened to seize his GI insurance policy to effect immediate payment. Can they do this?

A. They cannot. These proceeds are exempted by law from claims of private creditors.

Q. I understand some changes have been made in annual flying requirements. Can you outline these for me?

A. AFR 60-2, dated 18 April 1960, prescribes annual flying hour requirements, flight examinations, and evaluation procedures.

Q. I have been told that Korean GI term-insurance policies may now be converted to a new plan. Do you have the details of this program?

A. Policies whose numbers are preceeded by the letters "RS" may now be exchanged. Premiums are about two-thirds less than those presently in force. While protection is equal, such policies may not be renewed after age 50; however, they may be converted to a permanent plan any time prior to the last renewal period.

Q. What is the numerical designation of the regulation which governs the selective reenlistment program, commonly referred to as 55/45.

A. AFR 39-2, dated 23 March 1960.

AIRBORNE FROM BIRTH. *A Convair B-58* **Hustler** *settles back to earth after a trip down an elevated assembly line. Earlier this year, the double-Mach weapon system began entering SAC's operational inventory where it will take its place as part of the combined bomber-missile retaliatory force. Capable of delivering a nuclear weapon or acting as a platform for air-to-ground missiles, the* **Hustler** *becomes an important link in USAF's powerful deterrent chain.*

Panorama

OUR AIRMINDED ANCESTORS. *Thirty-nine years ago this month, Gen. Billy Mitchell and his determined fliers launched an attack from Langley AFB, Va., against several naval vessels lying off the Virginia capes. Among them was the* **Ostfriesland,** *a captured German battleship. Damaged but still afloat after continued attack with bombs no larger than 600 pounds on July 20, the WW I giant succumbed to a battering by 2,000-pounders the following day. This success was but one act in General Mitchell's extensive drama which eventually won recognition for airpower as a distinctive military instrument.*

BOFFS IN BLUE

Research often turns up some strange stories. A case in point is the following gem gleaned during a recent trip to the Azores by one of THE AIRMAN'S writers.

There is a church in the village of Praia, just off base from the MATS installation at Lajes Field, where Columbus stopped to pray before continuing westward on his second voyage of discovery. While their leader was at prayer, Columbus' crewmen, presumably using the Queen of Spain as a credit reference loaded fresh water. The village books still carry an unpaid water bill charged to the explorer. Several MATSmen stationed at the base have expressed their intention to square the debt, but so far, Columbus is still listed as delinquent.

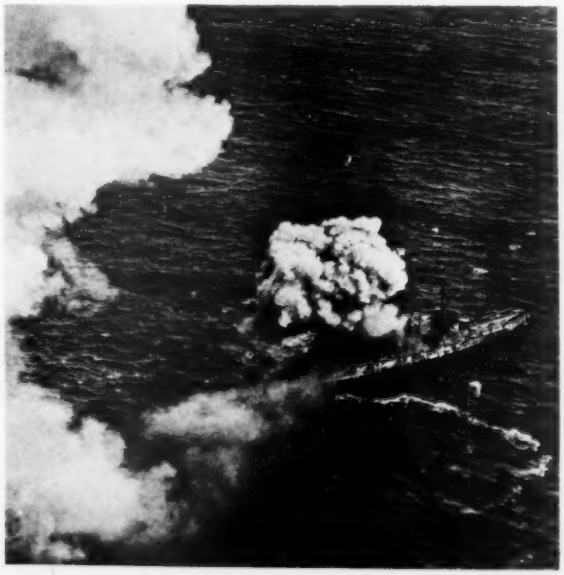
Even such strange notes from history can hardly top the fish story being told at Tyndall AFB, Fla.

This is a switch on the worn sagas of the ones that got away, because somewhere in the Gulf of Mexico a giant ling is probably regaling his drinking buddies with the tale of the angler fate snatched from his fins.

The ling's story began with MSgt. and Mrs. Charles Allen's recent fishing trip into nearby Gulf waters. After a fruitless day they turned toward shore, Mrs. Allen trolling in a final effort to break the drought.

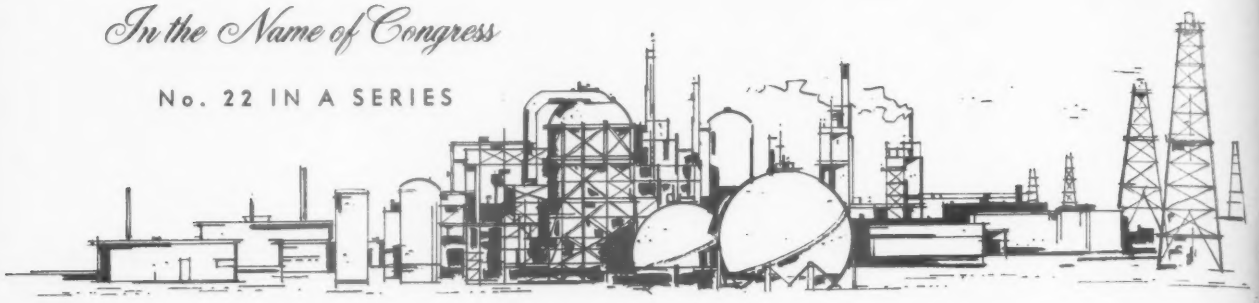
Just short of the dock, a big ling struck the trailing lure. Mrs. Allen fought her finny adversary gallantly for several minutes, then faded as the fight grew in intensity. Finally she called her husband for help. As the battle continued, she beached the boat and her husband took to the surf, dragging his "catch" as he headed for shore. In waist-deep water, Sergeant Allen, gaff secured to his wrist, sunk the larger hook into the ling's gills.

Gaining added strength in its fight for life, the big fish took over completely. Charley Allen spent the next few minutes trying to surface while he struggled to free his gaff. At last, the thoroughly exhausted Sergeant Allen gained his feet just in time to see the triumphant fish swim slowly off—chuckling to himself, Allen swears.



In the Name of Congress

No. 22 IN A SERIES



After the successful cross-Channel invasion of June 6, 1944, the familiar name of Ploesti once again entered the news as a key target of the

OIL OFFENSIVE

by SMSgt. Hal Bamford

JUNE 23, 1944, dawned bright and clear in Italy and, as 97th Bomb Group personnel prepared for their run to Ploesti, Rumania, Lt. David R. Kingsley silently hoped that on his 26th birthday, four days hence, he would enjoy weather equally as beautiful.

Although he had been in combat less than three months, Lieutenant Kingsley was already a veteran of the air war and today's assignment for a return to Ploesti seemed little more than routine to him.

True, the target was still regarded as one of Europe's three most heavily defended, but he had been there before and, with the oil offensive in full swing, he felt sure that today's trip would not be his last to this area before his tour ended.

Before the day was over, however, bombardier Kingsley would die—martyr to the cause of his fellow man.

Dave Kingsley's road to aerial combat had not been a smooth one. After enlistment in April 1942, he entered pilot training but was eliminated the following February. However, his determination carried through bombardier school and, on July 10, 1943, he received his commission and bombardier wings at Kirtland AFB.

The following month he completed navigational training and moved into the combat crew portion of his flying career. Finally, in April 1944, Lieutenant Kingsley was ordered overseas and reported to the 341st Bombardment Squadron, 97th Bombardment Group, based in Italy.

In the weeks that followed, Lieutenant Kingsley participated in a total of 19 combat missions against targets in southern Europe.

Prior to D-Day, the bomber offensive in Europe had been aimed primarily at the German Air Force and the construction units which made them a potent force. In addition, however, petroleum, the vital fluid that kept both army and air force alive, took on renewed importance. The 15th Air Force, of which Kingsley's group was a member, was nearest to most main petroleum targets and began to mount a growing number of assaults on such installations in Southern France, near Vienna, Austria, and in the well-known Ploesti area.

During April and May, major raids, employing as many as 700 aircraft, had caused extensive damage in this latter area and forced the Axis to adopt new defensive measures to protect their vital fields and installations. Most prominent among these was the use of smoke pots which often completely hid the target.

On the morning of June 23, as the bombers neared the key Rumanian target, they noted this smoke screen tactic was being used effectively. Just south of Ploesti, a segment of the 761 assigned aircraft broke away from the main formation and headed for the oil storage dumps at Giurgiu.

The others droned on toward the main target. While bombardiers fretted at the prospect of releasing their loads blindly, other crewmen derived a measure of satisfaction from the same smoke haze by rationalizing that antiaircraft gunners would be forced to fire as blindly as the bombardiers would be forced to bomb.

In Lieutenant Kingsley's B-17, the pilot turned onto the final run and released the ship to his experienced bombardier. Seconds from the target, the ship was rocked by flak and staggered out of formation.

The action which followed is dramatically detailed in the citation which was published in War Department General Order 26 the following April.

For conspicuous gallantry and intrepidity in action at the risk of life above and beyond the call of duty 23 June 1944 near Ploesti, Rumania, while flying as bombardier of a B-17 type aircraft. On the bomb run Lieutenant Kingsley's aircraft was severely damaged by intense flak and forced to drop out of formation but the pilot proceeded over the target and Lieutenant Kingsley successfully dropped his bombs, causing severe damage

PM 1/C THOMAS E. KINGSLEY *receives his brother's Medal of Honor from Maj. Gen. Ralph P. Cousins, Commander of the Western Flying Training Command, where Lt. David R. Kingsley received most of his flight training.*

to vital installations. The damaged aircraft, forced to lose altitude and lag behind the formation, was aggressively attacked by three ME-109 aircraft, causing more damage to the aircraft and severely wounding the tail gunner in the upper arm. The radio operator and engineer notified Lieutenant Kingsley that the tail gunner had been wounded and that assistance was needed to check the bleeding. Lieutenant Kingsley made his way back to the radio room, skillfully applied first aid to the wound, and succeeded in checking the bleeding. The tail gunner's parachute harness and heavy clothes were removed and he was covered with blankets, making him as comfortable as possible. Eight ME-109 aircraft again aggressively attacked Lieutenant Kingsley's aircraft and the ball turret gunner was wounded by 20-mm. shell fragments. He went forward to the radio room to have Lieutenant Kingsley administer first aid. A few minutes later when the pilot gave the order to prepare to bail out, Lieutenant Kingsley immediately began to assist the wounded gunners in putting on their parachute harnesses. In the confusion, the tail gunner's harness, believed to have been damaged, could not be located in the bundle of blankets and flying clothes which had been removed from the wounded men. With utter disregard for his own means of escape, Lieutenant Kingsley unhesitatingly removed his parachute harness and adjusted it to the wounded tail gunner. Due to the excessive damage caused by the accurate and concentrated 20-mm. fire by the enemy aircraft the pilot gave the order to bail out, as it appeared the aircraft would disintegrate at any moment. Lieutenant Kingsley aided the wounded men in bailing out and when last seen by the crew members he was standing on the bomb bay catwalk. The aircraft continued to fly on automatic pilot for a short distance, then crashed and burned. His body was found later in the wreckage. Lieutenant Kingsley by his gallant heroic action was directly responsible for saving the life of the wounded gunner.

Post-strike reconnaissance photos indicated the raid had enjoyed extensive success despite the fact that the bombardiers had been forced to release their lethal loads at obscured targets. Additionally, the secondary raid at Giurgiu had inflicted an "exceedingly high degree of damage" in that area.

Award of the Medal of Honor, this Nation's highest decoration, to Lt. David R. Kingsley, marked the 31st such honor to be bestowed upon a member of the air arm, and the 26th of World War II.

More important, however, it once again focused attention on this vital Axis oil area in the Balkans. Kingsley's Medal was the sixth which had been awarded to crewmen for their part in the continuing assault on the Rumanian installations in and near Ploesti.

(*Editor's Note:* Five previous Medals of Honor had been conferred on Air Force members for their part in the first major attack on Ploesti which was launched on August 1, 1943. This action was described in *Priority Mission,* October '59 issue, THE AIRMAN.)

Shortly after publication of the award, Lieutenant Kingsley's brother, PM 1/C Thomas E. Kingsley, himself a combat veteran, received the Medal on behalf of the hero's family from Maj. Gen. Ralph P. Cousins.

PLOESTI FROM THE AIR. ***Note the smoke pots which line the perimeter around the target. In spite of this protective cover and stubborn combined air-ground defense, bombers on this raid scored a vital hit.***

HOME OF HISTORIC HANDSHAKES

by A/1C Gerald Egyes, *Andrews AFB, Md.*

FOURTEEN years ago the Andrews Field *News* carried a story headlined: ANDREWS FIELD SLATED FOR KEY POSTWAR ROLE. The military potential of the gigantic base was described in terms of the number of combat aircraft that could take off simultaneously and it was pointed out that runway facilities could be expanded to handle a much greater traffic load should the need arise. It is doubtful that the writer of that story, or even his most visionary reader, could have realized that Andrews AFB would one day play an important role in the search for international understanding.

Andrews is, today, a vital part of America's defense arsenal. But it is better known as site of historic handshakes between heads of governments than it is for its mach-busting jet fighters. Airmen stationed there take a great deal of pride in the knowledge that Andrews is the starting and terminal point of President Eisenhower's friendship flights to countries in Europe, Asia, Africa, and Latin America.

Dignitaries of the United States and Foreign countries tread the red carpet at Andrews with increasing regularity. They have brought this gateway to America into the spotlight of national and world recognition, intensified by the eight-column headlines sparked by the visit of Chairman Nikita S. Krushchev, the arrivals and departures of President Eisenhower, and such notables as Secretary of State Herter, Mexican President Adolfo Lopez Mateos, British Secretary of State for Air George R. Ward, and other representatives of world governments.

Located in Maryland just outside the rim of cosmopolitan Washington's circle, Andrews is a beehive of Air Force activities. The once hectic turmoil perpetrated by the travel plans of heads of state has smoothed into a routine, though still industrious activity.

Andrews' role evolved from several factors, the primary being its proximity to the Nation's Capital. It has the capability of handling the larger aircraft in all kinds of weather, and, being a military base, it can provide more personal security than a civilian airport. It also has all the facilities of customs, immigration, and similar services.

But behind the facade visitors see at Andrews, lie airtight security, rapid, efficient servicing, and an overall

Colonel William T. Smith
Commander, Andrews AFB.

plan as detailed as any wartime operations order. Where heads of state are involved, red-carpet welcomes and quick rides to the heart of Washington aren't as simple as they sound. The job takes the coordination of hundreds of people and involves as many jobs.

"Such coordination," Andrews' commander Col. William T. Smith says, "comes to the forefront of the base's mission during important visits. But," he hastens to add, "the chief mission of Andrews is to provide support for its assigned and attached units and to satisfy flying requirements for pilots in the Washington area."

Each time the field becomes a terminal for distinguished visitors, proper coordination for each arrival and departure is discussed at several briefings before the event.

The Khrushchev visit, for example, required numerous meetings and briefings which were attended by representatives of the White House, State Department, Secret Service, Military District of Washington (MDW), Bolling AFB's 1100th Security Squadron, and the units at Andrews that supported the event. Ceremonial procedures were, and generally are, handled by the 1100th Security Squadron, the official Air Force ceremonial unit.

The base's overall participation is controlled by Lt. Col. David A. Sacknoff, hard-driving Director of Operations for the 1001st Air Base Wing.

"The preparatory conferences," he points out, "set the pace for the multitude of jobs and hundreds of people from our base units. Most of these people put in many hours of overtime for arrivals and departures and they all follow the organization master plan base officials use to guide their planning."

Under this master plan, local flights are controlled by Col. Roswell Freedman's Operations Group which files flight plans and works closely with radar approach control crews and the tower. The operations men also secure and clear the flightlines. Thirty minutes before and 15 minutes after the arrival and departures, all air traffic is halted.

Helicopters hover overhead surveying firefighting and medical teams. One helicopter carries medical specialists from the USAF Hospital at Andrews. Other medical men stand by with ambulances in the immediate area.

Ground firefighting is the job of the 1001st Installations Group and mobile equipment is positioned for instantaneous response. In cooperation with other military and civilian organizations in the area, installations also furnishes power to run any electrical equipment needed during a ceremony.

Overall security at the main gate and restricted areas falls naturally to the 1002d Air Police Squadron, commanded by Maj. Robert T. Best. This unit guides the unusually heavy sightseeing traffic on the base before and after each ceremony. In the immediate ceremonial area the secret service maintains control, but is assisted by the air police in security units and honor guards.

Honor guards, which also serve the dual function of aiding air police in crowd control during special occasions, are formed by airmen from each base squadron.

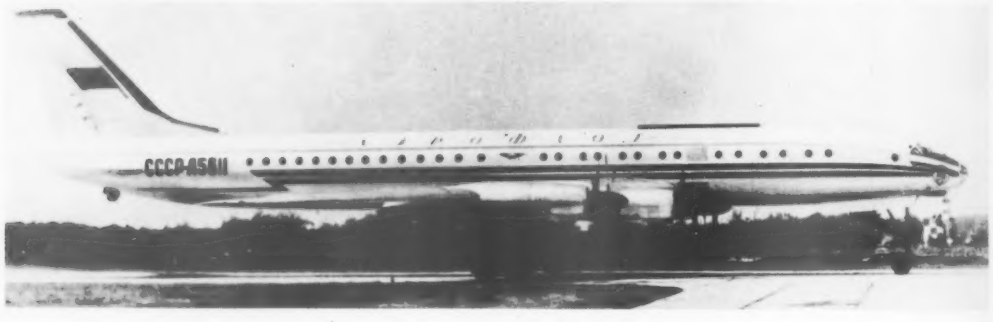
Transportation is generally handled by the State Department and the White House, either separately or together. Back-up assistance, however, is furnished by the 1001st Transportation Squadron at Andrews, commanded by Lt. Col. Bo Saunders.

A VC-137A of the Special Air Missions Detachment, 1254th Air Transport Group, on the Andrews flightline.

Secretary Herter on his return from a trip to Europe.

Working out their flight plan are an American pilot and a Canadian pilot at base operations on Andrews.

Russian TU-114 transport arrives at Andrews AFB with Soviet Chairman Nikita Khrushchev. Air Force POL crew later serviced the huge turbo-prop aircraft.



Aircraft of the Soviet Union have landed at the base on several occasions, but no particular difficulties in language or understanding appeared. During takeoffs and landings communication between the Soviet jets and air traffic controllers posed no special problems. Extensive pre-planning between the commander of the 1909th AACS Squadron, Maj. William W. Graham, and the Russian Air Attaché ironed out most of the possible wrinkles.

Further, an American pilot, a navigator, and a radio operator—all fluent in the Russian language—were aboard the aircraft. For the convenience of the Russian pilots, altitudes and distances of the approaches were converted to the metric system.

One problem caused by Chairman Khrushchev's personal TU-114 turbo-prop, was the need of an extension ramp high enough to reach the aircraft door. Not available at Andrews, a suitable ramp had to be flown in from New York's Idlewild Airport.

Some American airmen, after touring the big Soviet jet, were offered some Russian cigarettes which they graciously accepted. But when they offered the Russians some American cigarettes, a strict-looking individual glared his disapproval. The cigarettes were refused.

Since most of the events which transform Andrews into a terminal point for world-famous statesmen are of international interest, quick dispatch of news and photos is imperative. A gigantic press gallery, staffed by reporters, radiomen, television technicians, wire-service representatives, and communications specialists, is established on the ramp. Nearly 500 members of the press covered Chairman Khrushchev's visit.

To further facilitate the rapid release of news, a press room is set up close to base ops for the big events. During the Soviet Premier's visit signs in Russian pointed the way. Manned around the clock by members of the Andrews Information Office, the room is well stocked with typewriters, phones, paper, and pencils for the use of newsmen. For the press people covering the story, the Base Photo Lab makes a practice of offering its laboratory space for wirephoto equipment and extra phones.

And so it goes: Red-carpet welcomes amidst lights, cameras, action—plenty of action.

You should know

ATOMIC AIRCRAFT

Development of a nuclear powerplant for aircraft propulsion is continuing. Most recent success has been in Heat Transfer Reactor Experiment No. 3 (HTRE-3) being conducted at Idaho Falls, Idaho, by General Electric Co. under contract with USAF and the AEC.

HTRE-3 was built to obtain data on the design and development of advanced powerplants using sustained nuclear turbojet principles in the direct air cycle method. In a recent series of tests this powerplant was operated successfully for 120 hours, 65 of them continuous.

B-70 BRAIN

IBM is continuing, with reduced effort, the development of an advanced Bombing Navigation Missile Guidance System originally designed for the B-70 following direct contract agreement with the Air Force. Work on the system was terminated late last year when the B-70 project was severely cut.

A green light was given this project, however, since it was already far along in development, and the components of this complex system can be applied to other advanced weapon systems.

ONE TO A CUSTOMER

Only one Class E allotment can be made by an airman for credit to his account at a banking institution. Money so credited, however, can be applied by the bank to any purpose authorized by the airman.

A recent AFAFC digest points out that a second Class E allotment to a banking institution cannot be made unless it is for the repayment of a loan for the purchase of a home, including a mobile home or trailer. This does not include home-improvement and similar loans.

OVERSEAS OBSTACLE

If you want to take your car overseas, remember that the government will not ship it for you unless you have a waiver from any bank or other agency holding a lien on it. Few banking institutions are inclined to grant such waivers.

MEN FOR MISSILES

Today's SAC missileer is the product of many hours of training which comes in four orderly phases. First a potential missileer learns the theory of maintenance and operation of missiles, and then gets on-the-job training at missile bases and sites. During this second phase missilemen work with contractors during installations and check-outs.

After weeks of this OJT, missileers go to Vandenberg AFB, Calif., where they learn advanced theory, management, maintenance, and operation techniques. Then they return to their home station for more over-the-shoulder training while awaiting completion of missile facilities.

FLYPOWER

The common fly, carrier of disease payloads, flourishes in an unsanitary environment. The National Pest Control Association estimates that a single pair of flies can produce 191,000,000,000,000,000,000,000 (24 zeroes) offspring in a single summer. Defensive measures include the use of repellent chemicals on your skin or clothing and disposal of food exposed to flies. Offensive measures include: check of the screens in your home or barracks; use of fly paper, spray, or traps inside your quarters, and spraying insecticide on garbage cans, porches, screens, etc.

TENSION, TENSION

Every moment you're behind the wheel of a car is a possible emergency. When danger threatens there's no time to think. Your reactions must be spontaneous and here are some to consider.

If your brakes fail (your foot is already off the accelerator), pump your brake pedal up and down. If this fails to stop you, apply your emergency brake. If this too fails, shift to a lower gear and pull off the street or road as soon as it is safe.

If a tire blows out grip the steering wheel tightly and DO NOT slam on the brakes. Hold the wheels as straight as possible and slowly ease up on the gas pedal. When the car has slowed down, step lightly on the brake until stopped then pull off the road to change your tire.

If your car catches fire pull off the road, turn off the ignition, and get everyone out of the car and clear of it. Send someone to call the fire department and then use a fire extinguisher *from outside the car* if you have one. If any fire approaches the gas tank, keep a safe distance.

Oncoming headlights often blind drivers. If you face these bright lights, don't slam on your brakes. Slow down gradually or stop. If you pulled to the side of the road, don't go back onto the highway too quickly.

—MSgt. PAUL J. TURNER

Are you being gypped?

by Dave Karten, *Airman Staff*

"DOLLAR FOR DOLLAR, you can't beat our values." That's the slogan of the used car lot near a midwest air base where Airman "Bill Smith" recently went to answer an ad offering *Tested Value Cars* for $350. He found two such bargains on the lot and bought one of them.

Through hidden and unsuspected charges, the price of the car was upped to $795 in his finance papers. A check with authorized dealers showed that $595 would have been their top price for this car if it had been in A-1 condition. Actually, the engine was in such bad shape that Smith had to replace it shortly after buying the car.

An airman stationed on the east coast thought a used car salesman was lending him an aged car for the weekend. He found he had bought it. Another airman tried to return a car he couldn't drive three blocks from the used car lot. He wound up with a mortgage on his home.

A WAF tech sergeant was told the blank documents she was signing were for "title and tags" on a $400 car she owned free and clear. When she opened the sealed envelope, she found not a title but a conditional sales contract. It said above her signature that she owed $500.

These are typical, recent used car buyers' complaints from the files of Air Force base legal offices. There are scores more like them, with variations.

The common denominator? In every case the airman involved put his signature to finance forms on which the *blank spaces* had not been filled in, and neglected to obtain a bill for the amount he agreed to pay.

The airman who signs a blank form and fails to obtain anything in writing to prove the agreed price may very well find that the price has been raised by the time he receives the filled-in finance papers, complete with his signature on them. He has in effect agreed to pay whatever amount the dealer has later filled in. The same goes for promises to make repairs, for guarantees, warranties, and for anything else a used car salesman tells you. Unless you get it in writing, you haven't a legal leg to stand on if the company fails to come through. You're stuck and it's too late for anyone to help you. Reputable dealers insist on putting their agreements in writing because they want you to know exactly what you're getting.

The airman who reads every word of every page he is asked to sign is less likely to be duped. The goal of the unscrupulous dealer is to keep you from reading. Complaints in the files of the base legal officers show their methods and their measure of success.

The tricks are endless. A frequently reported gimmick is the practice of folding over the contract or obscuring it with another piece of paper so that all the airman sees is the line for his signature.

During the past two years one Legal Assistance Office has averaged 100 complaints a year on gyp used car transactions. The situation became so bad that local laws were passed to regulate used car dealers and finance companies in the affected area. However, such laws do not eliminate the necessity for alertness on the part of airmen, since it is likely there will always be a small group of dealers who will attempt to evade the provisions of any law, and you still find unscrupulous dealers in areas where legislation has not been enacted.

"We have encountered instances," says one legal officer, "where airmen have been charged 'delivery and handling' charges although there is usually no reason for such an assessment in the purchase of a used car. Finance charges in some instances have amounted to 50 percent of the selling price of the vehicle. Many airmen have been charged exorbitant premiums for insurance and have been sold insurance they didn't need. Cars valued at $1,000 at the time of repossession have been resold to associates of a finance company for $300 and a deficiency claimed against the airman for the balance."

Advertisements for "worldwide financing" and promises that "we can finance you without restriction regardless of where you are stationed" imply that the airman can ship his car overseas without trouble.

In the fine print on the back of the conditional sales contract, however, is a provision that the car cannot be taken out of the place of residence without the written consent of the seller or assignee (the finance company) until all payments are made and title is vested in the purchaser.

The government will not ship a car overseas without a clear title or waiver from the lien holder. When an airman requests the waiver from a bank or finance company that doesn't have overseas connections, he is usually told: "We won't let you take the car out of the country until you pay it off."

Here are some common sense rules to remember before buying a used car:

1. You should never sign a contract until you have read it thoroughly and discussed its provisions with your legal assistance officer.

2. Never sign a contract unless *all* blank spaces have been filled in.

3. Never accept solely verbal promises from dealers. All provisions of your agreement should be contained in the written contract.

4. Never agree to pay "delivery and handling" charges unless you are given a legitimate reason for such charges.

5. Be sure that your contract doesn't provide for "pickup" or "balloon" payments. A pickup payment is a substantial payment due within a few days or a few weeks after the purchase of the vehicle and a balloon payment is a large final payment which usually amounts to many times the normal monthly payment on your car.

6. Be cautious of any transaction which provides for "no down payment."

7. Make certain that your finance charges are reasonable or else arrange for a loan through your own sources, rather than those of the dealer.

8. Request some identification from the salesman with whom you deal. At times, aliases are used by salesmen and it is then difficult to determine with which individual you did business.

9. Demand an itemized breakdown of the types of insurance included in the contract and the cost of each type. Don't agree to the purchase of any unnecessary insurance and if any premiums are exorbitant or "out of line," purchase insurance through your own sources. It isn't necessary for an airman to buy

accident and health insurance to protect the dealer since a serviceman's salary continues even if he is injured or becomes ill.

10. Make certain that the contract provides for the rebate of part of your finance cost and insurance in the event you pay off the loan sooner than the contract stipulates.

11. Be certain that the contract permits you to remove the vehicle from the local area in the event you are transferred on legitimate military orders. Often a conditional sales contract will not permit such a removal without the permission of the finance company and, in many instances, such permission cannot be obtained without costly refinancing in the event of a PCS transfer.

Remember that, although legislative bodies can enact laws for your protection and legal assistance officers can advise and counsel you, such assistance is useless unless you remain alert and take advantage of the help offered. Many problems which could be resolved easily prior to the time a serviceman signs a contract become insurmountable after he has signed the papers and may then result in the loss of money, his vehicle, or both.

Easy Credit

Unscrupulous practices in the installment sales of used cars is only one of the many ways in which Air

Force personnel are duped. "Easy credit" is another. Every week base legal assistance officers receive SOS calls from airmen who have been "deceived or misled" about the high rate of interest they pay for so-called "easy credit." The majority of the airmen victimized are "ignorant" of the actual interest rate they are being charged for loans and installment purchases.

In most cases their ignorance can largely be blamed on the deceptive and misleading methods used by money lenders to conceal finance charges and credit rates.

As a result many airmen pay actual interest rates two to three times higher than they believe they are being charged. Early this year a Senate banking subcommittee began hearings on a "truth-in-lending" bill that would require all lenders and installment sellers to state not only their total finance charges, but also the annual rate of interest on unpaid balances.

Few loan companies and installment credit firms now do this. Instead they employ all sorts of devices to conceal actual charges. Some of the methods used by finance companies to conceal exorbitant annual rates of interest include:

The "Add-On." The interest rate is figured on the full face of the amount of the credit, rather than on the declining balance. Thus what may be advertised as "6 percent" financing figures out to be an annual rate of 11 percent.

The "Discount." This is a variation of the "add-on" with the interest charge being deducted in advance from the face amount of the loan or credit. The interest rate is usually higher than the airman thinks.

The "Monthly Rate." This is used for small car loans and revolving credit accounts where the interest is stated at, for example, 1½ percent a month. Even if applied only to the unpaid balance, this works out to 18 percent a year.

Extra Fees, Service Charges, Insurance, etc. These are seldom reflected in quoted interest rates. One state, for example, has a 6 percent limit on large or "industrial" loans. But when fees, service charges, and "interest on interest" are included, the actual rate often exceeds 20 percent.

Questionable Practices

Questionable practices have become so widespread in Europe and the Far East that some base commanders have prohibited almost all solicitation by salesmen on the base. Still the unethical practices flourish outside the gates or by mail. In one racket, for example, airmen about to return to the ZI are sold new or used cars for delivery at arrival ports. When it's too late to do anything about it, they discover that neither the car nor the price is as promised.

One group of servicemen paid deposits amounting to several thousand dollars to a high-pressure salesman representing a stateside dealer. The salesman made off with their money and the dealer disclaimed him. Under threat of prosecution, however, the dealer returned the deposits.

Encyclopedias

It's pretty hard to get a 24-volume set of an encyclopedia into an Air Force duffel bag but that hasn't stopped gullible airmen from buying dozens of sets. In fact, the market is so lush that encyclopedia salesmen often use ingenious ruses to get into air bases, barracks, or Air Force family homes even after they have been barred. At one air base, salesmen told prospects they were from "the base education office" and working in cooperation with "the PTA."

A companion promotion is the sale of deluxe editions of the Bible. One young airman sent home a Bible that he had agreed to buy on the installment plan. Total cost: $60.

Insurance Solicitation

When the government itself went out of the insurance business after the Korean war a host of new, small, and highly unethical life insurance companies sprang up. In one memorable case, a company insured a 17-year-old serviceman, cashed his premium checks regularly for three years, then refused to pay the claim upon his death on the grounds that the policy application had never reached the home office. The beneficiary finally won the case in court.

Today the questionable practices engaged in by some life insurance companies consist chiefly of high-pressure "gimmick" selling; pushing expensive endowment policies to young airmen who might be better off buying ordinary life. They claim that the policies they sell are really "savings plans."

One insurance solicitation scheme uses the airman's parents as the prospects. Here's how it works: The insurance company stations agents near an Air Force base to hand out "safe arrival" picture postcards to airmen coming into the Air Force. The cards are filled

out by the unsuspecting personnel at their own option, and returned to the representatives of the insurance company who mail them on to the parents at no cost to the airmen.

The gimmick? Prior to mailing, the addresses are thoughtfully recorded by the insurance salesmen for solicitation later on. Before long the airman's parents receive a letter of solicitation from "Parents Counseling Service." It congratulates them on their son's entry into the Air Force, points out that he has no government insurance, and offers "unrestricted insurance protection that will lead to financial security." Service benefits are carefully ignored. The letter suggests that the parents pay the premiums for one or two months and that the airman then continue the monthly payments by government allotment.

The USAF makes it a policy never to supply names, addresses, or any other information that would be useful to firms vending merchandise or services on an individual basis. Air Force regulations strictly prohibit release of names and other personal information. There are nevertheless a number of "legitimate-but-marginal" methods, such as the "safe arrival card" gimmick, by which insurance companies and other commercial firms secure such information.

Auto Insurance

Although civilians under age 25 have difficulty buying auto liability insurance, this is no problem for the young airman. He is offered all kinds of policies. Why? Because they are generally written by small, unknown companies and sold by mail. They are also so full of exclusions and exemptions that they are more of a delusion than a protection.

A popular ruse is to sell a policy that is good only while the driver is on an air base. Insurance companies selling such policies make a nice profit because most air bases are so heavily policed that an airman can hardly have an accident if he wanted to. Once off the base, of course, he is not covered.

There are, of course, far more legitimate and honest business firms than dishonest ones. But airmen looking for "sharp" deals often are attracted to firms of the latter type.

From all this it can be seen that many airmen encounter difficulties or become victims of unfair practices and fraud simply because they lack basic knowledge of their legal rights and obligations. Before you sign to buy *anything*, a visit to your legal assistance officer can save you a lot of headaches and money.

Remember that even the smartest of us can be "taken" by promoters unless we are on guard against high-pressure "gimmick" selling. Your legal assistance officer can offer knowledgeable advice while there is still time to do something about it.

Phineas T. Barnum's old maxim: "There's a sucker born every minute and two to take him" may not apply to you, but it could. By seeking sound advice from your legal assistance officer *before* you make purchases or sign contracts, you can make sure that it won't.

It had to be a one-time approach with

No Room for Error

by SSgt. David L. Edwards, Shaw AFB, S. C.

It all began as just another normal tour of duty on Thursday evening, March 17. TSgt. Marion E. Lloyd, control tower watch supervisor, 2020th AACS Sq., climbed the last of the 111 steps to the top of the control tower unaware that in exactly nine minutes he would be instrumental in saving a human life and a valuable aircraft.

Meanwhile over Columbia, S. C., Lt. Colonel Akin of the Tennessee Air National Guard was flying his F-86L on instruments en route from McGee Tyson, Tenn., to Travis Airport, Savannah, Ga., when he heard an explosion in his aircraft and experienced an immediate flameout.

Colonel Akin called on his radio to "any station 16064, MAYDAY . . . flameout . . . I'm over Columbia at 33,000 feet descending."

Immediately Sergeant Lloyd responded to the striken aircraft.

MSgt. James R. Reynolds, also of the 2020th, alerted the direction finding net and air rescue and activated the crash alarm system.

Two minutes after the first MAYDAY transmission, Colonel Akin broadcast faintly that he was over Shaw, and was experiencing loss of all communications and electrical equipment due to battery failure. Up to this time he had received a total of six landing instructions.

Capt. William E. Sanders from the 29th Tactical Reconnaissance Sq., flying his RF-101 on a local training mission, was requested by Sergeant Lloyd to perform a "chase mission" to assist, if needed, in guiding the crippled aircraft to a position where a safe landing could be accomplished.

The RF-101 *Voodoo* escorted the F-86 and provided moral support for the remainder of the approach.

This had to be a one-time approach. There could be no mistake . . . no room for error. The aircraft was without power and would be unable to make a second attempt.

Tires screamed as the plane touched the runway and rolled to a stop in front of the control tower.

As Sergeant Lloyd looked down from his tower at the stilled aircraft, he watched Colonel Akin open the canopy and stand in the seat—arms stretched to the Heavens above in a gesture that could only mean thank you, thank you, I made it.

SLANTS ON SPACE

There are 9,200 solar cells in the array which charges the batteries of *Tiros,* the meteorological satellite whose photographs of weather phenomena have made scientific history.

Which way is North on the Moon? This is the burden of numerous inquiries from airmen who have acquired lunar maps, whether of the photographic or cartographic variety. Some show North at the top of the map where we are accustomed to find it on hemisphere charts of the Earth; others have South at the top and North at the bottom, with surface features switched around accordingly. Which is right?

Either one. Here's the explanation. Astronomical telescopes invert the images of celestial objects on which they are focused. The first men to study the Moon with such instruments naturally mapped lunar features the way these appeared through the telescopes. When the charts were printed for the use of other students, the Moon's face was kept inverted because that was the way it would be seen after the drawings had been consulted for reference. Thus the convention became established. The adaptation of the camera to astronomical work in the last century brought no essential change; pictures of the Moon and other heavenly bodies photographed with the image inverted. Since no scientific purpose would be served by going to the trouble of making sure a negative was reversed for printing, astronomers didn't bother. Hence, the pictures or drawings which illustrate the professional literature of astronomy are all upside down, with very rare exceptions.

Printing photographs and maps of the Moon "right side up," so to speak, is an innovation linked to popular interest in space subjects and is calculated to avoid the confusion a layman might have upon seeing the familiar compass signs reversed.

Strictly speaking, we don't know whether the Moon has a North and South, and we won't learn until we get a terrestrial compass up there to check. Patrick Moore, noted British astronomer and lunar specialist, points out: "The Moon may or may not have a magnetic pole. Very probably it has, but we have no idea of either its position or its strength."

Peaceful coexistence gesture? One of the features on the far side of the Moon disclosed in photographs made by *Lunik III* has been named in honor of Thomas A. Edison, noted U. S. inventor. Other non-Russians to be honored by the Soviets in the distribution of place names include: Jules Verne, the French science fiction writer; Heinrich H. Hertz, German discoverer of radio wave propagation; James Clerk-Maxwell, Scotch pioneer in the field of electromagnetism; Louis Pasteur, French chemist and bacteriologist; Marie Sklodowska Curie, Polish-born physicist and chemist who was the codiscoverer of the element radium, and Tsu Chungchih, a fifth century Chinese astronomer and mathematician remembered because he computed the value for pi, describing the relationship between a circle's diameter and circumference with an accuracy that stood unsurpassed for more than 1,000 years.

How easy is a "soft" landing in space exploration? It means an impact at a velocity of roughly 50 miles an hour or less. Instruments could be packaged to operate efficiently after such a shock. Man's ability to survive an impact of that G force without injury is evident from the fact that many automobile drivers who use safety seat belts have emerged unhurt from motor accidents occurring at speeds greater than 50 m.p.h.

The flight of *Pioneer V* out to an environment within six or seven million miles of the orbit of Venus is a reminder that the English language lacks any adjective derived directly from the name of the planet. Unabridged dictionaries list that name and another noun, Venutian, the latter being defined as an imaginary inhabitant of Venus. Suggestions that the word, Venusian, be coined for use as an adjective have made language scholars wince because it is odd sounding and ugly. In Greek mythology the counterpart of Venus, as the goddess of love and beauty, was Aphrodite. She also was known as Cytherea because of her fabled association with that island in the Ionian archipelago. The word's adjectival form, Cytherean, is good usage for referring to either Aphrodite or Venus. Now if readers encounter mentions of the Cytherean atmosphere, orbit, etc., they can decode what is meant.

The development of radio astronomy gives a prophetic touch to the title Galileo gave to the first account he wrote in 1610 of his observations with the newly invented telescope. He called it, "The Message of the Stars," or *Sidereus Nuncius* in the Latin in which he wrote the paper. Unfortunately, the word *nuncius* has alternate meanings of messenger and announcer and was generally interpreted in that personalized sense, despite Galileo's vain protests that he had not chosen the word to convey that impression. English translations of the historic paper invariably have rendered the title as "The Starry Messenger." Now that radio telescopes around the world are tuned intently to the messages celestial broadcasting sources are transmitting, perhaps future editions of his writings to appear in English will revert to the title he really had in mind as being more appropriate in view of developments.

—WILLIAM A. KINNEY

in my opinion

LIBERALITY IN OJT

(*Editor's Note:* The opinions expressed herein are those of the author and do not necessarily represent the views of this magazine or the United States Air Force. *In My Opinion* is presented as a medium by which members of the Air Force may discuss their views on various subjects.)

Trainer Enthusiasm + Trainer Cooperation = Skilled Airman

by TSgt. Everett R. Denny, *Offutt AFB, Nebr.*

In my opinion *Complacency in OJT*, published in the April 1960 issue of THE AIRMAN, inversely reflects the existing OJT program. Undoubtedly there is some complacency on the part of NCOs and officers, however, it has been my experience in the past few years that the complacency exists mostly on the part of the trainee. At the present time it is fairly difficult to place an airman on 7-level OJT due to UMD authorizations and in some career fields next to impossible. Being placed on OJT for the 7-level is a Golden Opportunity for a blessed few. One would think that airmen given this Golden Opportunity would have enough initiative to go all out and burn some midnight oil in their own behalf, but not our present-day trainee who expects the NCO trainer to hand him the knowledge on a Golden Platter. The 5-level trainee has this same point of view plus a version that goes something like this: "Why should I spend my off-duty time studying? I'm getting out after four."

At the present time I am performing the duties of squadron OJT supervisor. The air base wing, of which I am a small part, has one of the best supervised, monitored OJT programs I have ever become involved with. An airman assigned to a unit within this wing has no choice but to progress. In other words, we are trying to hand him the knowledge on a Golden Platter. Another point I would like to put across is this. The Air Force OJT program is being carried out in accordance with AFR 52-2. Group and squadron commanders are backing the program to the hilt. In the case of NCOs with negative attitudes toward OJT, I'm sure, if they are involved directly with OJT, this attitude is reflected or should be reflected in their efficiency ratings, promotion recommendations, etc.

OJT is the key to increased production and reduced costs.

A PIECE OF SCOTLAND THAT IS AMERICA'S

On the 7th of July, 1951, a KB-29 tanker crashed and burned in a Scottish glen, taking the lives of the 11 men aboard. The unfortunate accident distressed the good people of Carsphairn to whom—for the most part—aircraft meant only remote, impersonal silhouettes and sounds far in the sky overhead.

Bill Campbell, on whose farm the tragedy occurred, and his sister, Molly, were particularly thoughtful in the weeks that followed. They understood that somehow the peace and security of Brockloch Farm, the freedom to till the soil and reap the harvest given by God, depended on the efforts of the men professionally dedicated to the preservation of peace. Molly pondered on the sorrow of the widows, the mothers, and made up her mind that the memory of these men would be kept alive.

Through the winter, Molly threw herself into a series of modest fund-raising activities among her friends and neighbors. There was little enough in the way of material wealth in the surrounding hills and glens, but thanks to the sincerity of community feeling the goal was eventually attained.

A large cairn of stones, traditional Celtic mark of honor to a fallen warrior, was erected in Brockloch Glen, and a handsome slab of polished granite implanted bearing the names of those who had perished. There was a ceremony, of course, with the villagers dressed in their Sunday best to dedicate a tiny spot on a Scottish hillside that will always be American. There was a prayer or two led by the clergy, and a couple of hymns sung by the children. The ceremony closed with the mournful wail of a Highland piper's lament echoing from the rocks of the heather-clad hillside, and the wild birds leaped from their resting places to add their cries to the piper's song of sorrow.

—TSgt. E. HURLEY
Hq, Third Air Force

When the NCOs got the word, they raised their eyebrows. Then they raised the squadron's educational level.

EVERY MAN A SCHOLAR

by A/1C Luther Dalton, *Dover AFB, Del.*

photos by A/1C Robert L. Olson

WHEN Lt. Col. Vernon L. Head, commander of 20th Air Transport Squadron, brought the problem to his senior NCOs he had full confidence it would be solved.

"I want," said Colonel Head, "every man in this squadron to have a high school education. This will not only improve the squadron—it will also improve the individual."

The green beauty of that day in June lost some of its appeal as the NCOs looked blankly at each other. They felt they had been tossed a hot potato. Whoever heard of a squadron being manned by 100 percent high school graduates?

Then, in the tradition of all servicemen, they orally lamented the cruel and unjust task (to each other—not to Colonel Head).

Then, still in tradition, they did a little head-scratching. How could a squadron with 102 men on flying status attend classes? They were flying much of the time and would miss as many classes as they attended.

The answer wasn't as difficult as they had anticipated; they would persuade the men to take the GED high school tests. If they passed they would have fulfilled the requirement. It proved to be no trouble getting the men to take the tests. The word was passed to all sections what was in the wind and the section heads went along with the program by giving men time off to take the tests. Every man who didn't have a high school diploma took the tests and, to a man, passed them.

The colonel smiled benevolently upon his NCOs; the NCOs beamed at the other enlisted men; and the new graduates' chests grew several inches. From then on, the education program of the 20th, like Topsy, "just growed and growed."

Today the squadron may be unique. Every enlisted man has a high school education and every enlisted man is enrolled in ECI. Many have also taken USAFI courses, and every course completed, either ECI or USAFI, brings a personal letter of congratulation from the squadron commander.

MSgt. Thomas K. Thrower, Education NCOIC of the squadron, describes the success of the education program like this: "The initial problem was to instill confidence in the men. Most felt that, being out of school for several years, they wouldn't be able to learn as fast as they used to. We had to get rid of that problem fast. Everyone was urged through posters, commanders' calls and by personal interview to take at least one ECI course. In most cases we suggested they start with the 'Basic Doctrine for Character Guidance', a not too difficult course. A few tried it—and passed. Others tried. They also passed, and on December 29, 1959, we first learned we were 100 percent enrolled in ECI. At no time since then have we ever failed to have 100 percent enrollment in ECI except when a new man comes into the squadron. As soon as the new man finds everyone else enrolled he seldom wastes more than a week before he, too, gets in the act. It's only after the first course is passed that a man not only believes in getting an education for himself but actually becomes a disciple of education. The first course has given him confidence in himself. From then on, it's smooth sailing."

SSgt. James W. Steel, chief clerk with eight years in

the 20th, cited some of the effects of this interest in education: "Everything seemed to pick up once we had the program going full steam. Morale reached an all-time high. The men couldn't have been happier without taking tranquilizers. We have esprit de corps like I haven't seen since the second world war. And I think everyone knows about our unit-of-the-month record."

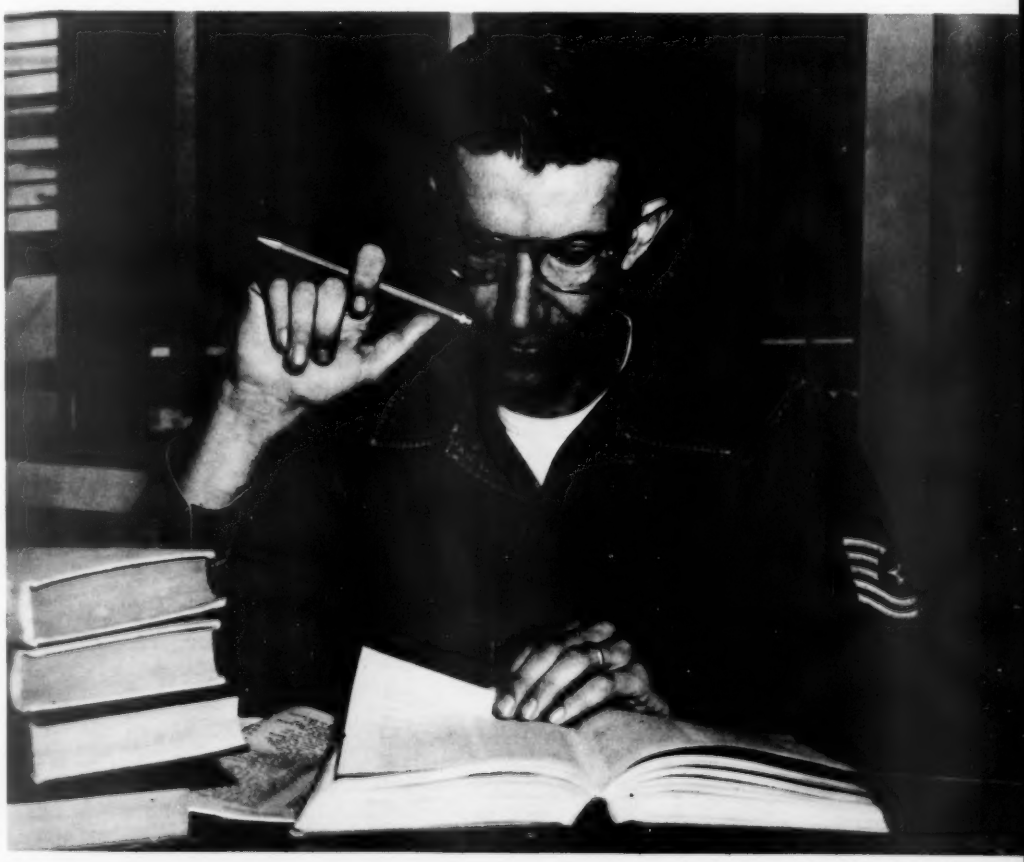
The sergeant was talking about the phenomenal record of the 20th in winning the unit-of-the-month award at Dover AFB. Since the inception of the program 15 months ago, the 20th has taken the honors nine times. With 21 units competing, this in itself might be a record of some sort. About 20 areas are taken into consideration in judging the contest. Education is one of those factors. With 100 percent high school graduates and 100 percent enrollment in ECI, the 20th has an immediate advantage over the remaining units.

Now every man in the 20th is determined to win the trophy every month. They haven't had an AWOL or incident of any kind since April 20, 1959.

"It isn't uncanny, really," said MSgt. Elmer D. Lewis, first sergeant. "With a good education program everything else follows a logical sequence. First, studying gives men something to do in those spare hours when time seems to stand still. Instead of stagnating, the men are accomplishing something really beneficial to the Air Force and to themselves. We now have 102 men on flying status but that doesn't stop those men from studying. On the contrary, it is not unusual to see a man take his books along on TDY. You can also find the men working on their assignments in the barracks. In fact, anytime there are a few minutes of leisure time our men generally put it to use."

Since December 19, 1959, 49 certificates of graduation from ECI and USAFI courses have been earned by men of the 20th. A certificate of graduation isn't regarded as an invitation to sit back and relax. It's an indication that the time is ripe for another course.

What the future holds in the way of education for the 20th might be prophesied by TSgt. Robert E. Martin, Base Education NCOIC: "The way these jokers are going now, it wouldn't surprise me a bit if some day they had all completed the college GED tests successfully. The only thing that puzzles me is why the rest of the Air Force doesn't wake up. I'm not trying to sell the 20th short—far from it—but actually they haven't done a thing that any other squadron couldn't do. I hate those people in the 20th anyway," he added with a twinkle in his eye. "They make too much work for me."



Using office space after hours, TSgt. Norman E. Hoffman, a flight engineer, finds time to crack the books. He has already passed the college GED tests and a course in aerodynamics. He is now taking a college course in world history.

THE MILKY WAY

The Milky Way has been advanced overnight from cosmic youth to a more mature age.

Shaped like a giant Fourth of July pinwheel spinning in space, the Milky Way is known as a spiral galaxy. It contains billions of suns, including the Earth's, vast clouds of dust and gas, seas of darkness—and countless mysteries.

The Milky Way's birthday was drastically challenged recently when an eminent British scientist assessed its age as 10,000,000,000 years, or double the previous estimate. Soon after, a leading American cosmologist suggested that it may be far older than that—perhaps as many as 24,000,000,000 years.

The varying estimates, both based on studies made at Palomar and Mount Wilson Observatories, Calif., illustrate how much is still to be learned about the past and future history of Earth's home galaxy.

Cosmic Distances Vast

The Milky Way is so big that light, speeding 186,000 miles a second, requires a hundred thousand years to cross it from rim to rim. By contrast, light flashes to Earth from the Moon in just one and a fourth seconds.

The Earth's solar family is embedded in one of the galaxy's faint spiral arms, far off center. The galaxy's nucleus is in the direction of the constellation Sagittarius, the Archer, which can be seen low in the southeast sky in May.

The galaxy as a whole is revolving. It takes the Sun roughly 200,000,000 years, or one cosmic year, to make one circuit.

Centuries ago man believed his Earth to be the center of the solar system, thus the hub of the universe. Then came the Copernican revolution, with proof that the Earth is a minor planet. Three decades ago man's ego got another jolt when astronomers discovered that the solar system is merely an insignificant part of the Milky Way, not its nucleus.

Even on a dark clear night earthlings can see only 6,000 of the Sun's 100,000,000,000 or so neighbors in the home galaxy. Without an aid to vision, man can detect only one object outside the Milky Way, and that is the famed M 31 galaxy in the constellation of Andromeda.

But there are thousands of millions of other galaxies, similar to the Milky Way. Existence of these huge star systems was shown afresh by the Palomar Sky Survey which charted the heavens to the distance of a billion light-years and expanded known space 25 times.

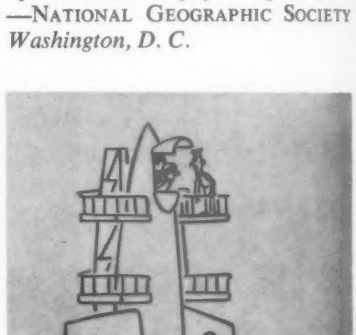
Veils of Dust and Gas

Ironically, scientists know more about the structure of neighboring galaxies, such as Andromeda's M 31, than their own. Clouds of dust and gas obscure a large portion of the Milky Way. Development of radio astronomy has enabled science, however, to capture signals from incredibly remote hydrogen atoms—the building blocks of the universe—and tell what is going on in the hidden parts of the Milky Way. Its spiral arms have been traced with fair precision.

Dutch scientists of the Leiden Observatory have learned that a ring of hydrogen gas is moving out from the Milky Way. At its center is a spinning disk of hydrogen.

Such discoveries are expected to influence the two main theories of the universe's beginning. One theory holds that it started literally with a bang—an explosion that hurled primeval matter into space. The alternative theory suggests that creation is continuous, with new matter coming from an unknown source and by an undefined physical process.

—NATIONAL GEOGRAPHIC SOCIETY
Washington, D. C.



"Do you want ham or liverwurst pills?"

Writing for THE Airman

The first journal of the Air Force began on September 21, 1918, as a four-page mimeographed publication known as *The Air Service Weekly Newsletter*. Its mission was to provide information to all Air Service members.

The journal continued through the years on an inconsistent basis and one year not at all. The name changed several times to reflect the organizational position of military aviation within the Army. It was known as *The Air Corps Weekly Newsletter, The Air Force Newsletter, Air Force,* and *AAF Review*. In September 1946, twenty-eight years after the birth of the original journal, publication ceased. In 1956 the Bureau of the Budget approved the present monthly publication and in August 1957 the first issue of THE AIRMAN was published.

THE AIRMAN was established because experience showed that the Air Force needed an official journal to augment the internal information program. It was designed especially to present authoritative views on Air Force policy, doctrine, and programs in an attractive readable format and style.

In addition, it was designed to assist in encouraging all qualified personnel to make a career of the Air Force; inform them on ideological differences; increase esprit de corps; improve morale; and keep everyone better informed of Air Force roles and missions.

Type of Articles Desired

Since THE AIRMAN is an Air Force-wide publication, its articles should be applicable and interesting to the majority of Air Force personnel. Articles that are of purely local interest and importance should be published in base newspapers or command-type publications. We seek articles or article ideas from anyone. Direct correspondence between the individual and the editor is authorized. Specifically THE AIRMAN is interested in articles or ideas in the following areas:

a. Any base or command program that may be of interest and adaptable to other bases and commands. These may be in the fields of commander's call, community relations, maintenance techniques, the People to People program, indoctrination of new personnel, programs that make a contribution to the national welfare, etc.

b. Individual or group acts of heroism. For example, a pilot chooses to ride his disabled plane to earth to insure that it does not crash in a populated area, a base gives all-out assistance to a community struck by a disaster, a person rescues or tries to rescue someone in distress, etc.

c. Cartoons that are applicable to the Air Force.

d. Sometimes a writer will team with an artist and submit an illustrated story. (Example: Stories where photographs are unavailable or impractical to acquire.)

e. Good photographs on general Air Force subjects. Please identify the photographer and personnel in the photograph. Credit will be given to the photographer. Photographs must be of excellent quality since we print by offset. We need photographs suitable for all four covers as well as inside.

f. Suggestions of articles you would like to read.

Type of Articles Not Desired

a. Base newspaper copy. We receive and screen all base newspapers. The information officer or editor will be asked to submit additional material on any story or photograph considered appropriate.

b. Base or command sports. We cannot cover individual events but will do it on an Air Force-wide basis.

c. Airman of the day, week, month, etc. These programs are local in nature and we do not have the space to list them all.

d. Social items from commands.

Adherence to these principles will result in considerable savings to a base in manpower and money.

Credits

All authors, photographers, cartoonists and artists are given by-line credit for material submitted and used, if they are identified.

Letters to the Editor are identified unless the author resquests that his name be withheld. In the latter instance, if the letter has to be referred to the Air Staff, a copy is made omitting the name of the author. We judiciously respect the individual rights of writers. We have letters of praise and condemnation. We invite comments or suggestions.

How to Submit Material

Anyone may submit material directly to THE AIRMAN. Address it to Editor, THE AIRMAN, Room 2-206, Tempo E, 4th & Adams Drive, SW, Washington 25, D. C.

If you desire the material re-

turned, there is no need to enclose a self-addressed envelope. Just state it in your letter. There is no need to send material special delivery. It receives no special handling.

Story ideas are welcome. These should consist of a brief outline of the article and its applicability to the Air Force as a whole. If you desire to write it—fine. If not, we will, if acceptable, send a writer. However, bear in mind that we have a limited staff and must watch our TDY budget closely. We try to combine several articles for one trip.

Editorial Suggestions

Examine your subject, ask and answer the following questions:

a. How is this important to the Air Force as a whole?

b. Why should the Air Force spend money to print it.

c. What would the Air Force gain by printing this article?

d. Can it be adapted and used at other Air Force bases?

If you can apply and answer satisfactorily the above questions, you have a good story outline. We are interested in it.

How You Get The Airman

a. THE AIRMAN is distributed free on a ratio of one copy for every 10 assigned Air Force persons on a worldwide basis. The information officer is required to establish this distribution with the publications distribution officer. Copies should go to the base library, service club, airman's club, NCO club, officer's club, dispensaries, clinics, operations, and other highly frequented areas. It should be in folders such as other publications. It should be distributed to units on a base.

b. Many persons, airmen, officers, and civilians subscribe to THE AIRMAN for themselves, husbands, wives, or parents. Subscription rates are $3.50 per year. Make checks or money orders payable to the Superintendent of Documents, Government Printing Office, Washington 25, D. C. This is a good gift for birthdays and Christmas. Through these pages everyone will get a feeling and understanding of your contribution to the defense of the United States. ROTC detachments can obtain additional copies by writing to the editor.

c. If you can't get a copy through normal distribution, contact your information officer.

Fingers Into Space

BEFORE man himself probes deeper into space, much more must be learned about the radiation belts Dr. James Van Allen discovered surrounding the earth in 1958. The depth, intensity, origins, lifetimes, and distribution of the charged particles trapped in earth's magnetic field to form these belts may well dictate the design of manned space vehicles and the orbits of satellites.

During the past year, Air Research and Development Command personnel have been collecting Van Allen Belt radiation data with a series of rocket shots. The rockets' sensing capsules have learned something of the mechanisms that keep the charged particles in place; measured the electron energy trapped in the outer natural radiation belt; recorded the rapid fluctuations in the earth's magnetic field above the ionosphere; and provided information on the intensity and angular distribution of the trapped electrons.

This ARDC space radiation study was started in the summer of 1958 by a group from the Air Force Special Weapons Center at Albuquerque, N. Mex. Last year they used the facilities of the National Aeronautics and Space Administration at Wallops Island, Va., from which they launched unguided *Javelin* rockets. The *Javelin* was an off-the-shelf composite vehicle with an *Honest John* first stage, a *Nike* second and third stage, and an X248 *Altair* engine for the fourth stage.

The 40 pounds of instrument and telemetry systems carried by the rockets were provided by Lockheed Aircraft's Missile and Space Division and by United Electro Dynamics. Nearly 50 feet long, the last solid-propellant *Javelin* was launched at an 83-degree angle. It approached a speed of 9,000 miles per hour and penetrated 670 miles into space before dropping the instrument package into the Atlantic Ocean 700 miles offshore. *Atlas* missiles, launched from Cape Canaveral, have carried similar scientific packages more than 700 miles into space to contribute still more radiation data.

A follow-on to the *Javelin* shots will be Project *Journeyman,* a series of solid-propellant ground-launched rockets now under development. The *Journeyman* series will measure radiation above 2,000 miles. In addition to the three instrument packages already carried aloft by *Atlas* missiles last year, six more will ride *Atlas* vehicles during 1960.

Meanwhile, the Special Weapons Center is testing a smaller rocket, the *Jaguar,* which will be air-launched from a B-57 jet bomber. Designed for vertical launch, the *Jaguars* will provide mobility to the space sounding operations and eliminate the need for launch pads while collecting radiation information to above 500 miles.

Lt. Col. James L. Beavers, chief of the Special Projects Division, was director of AFSWC's rocket sounding program. He coordinated and monitored the last *Javelin* shot over the facilities of the Atlantic Missile Range from Cape Canaveral. Maj. Fred Korbitz directed the *Javelin* countdown at Wallops Island. The rocket was assembled and checked out by a team from the 4952d Support Squadron under supervision of its missile engineer, Capt. Robert Babbee.

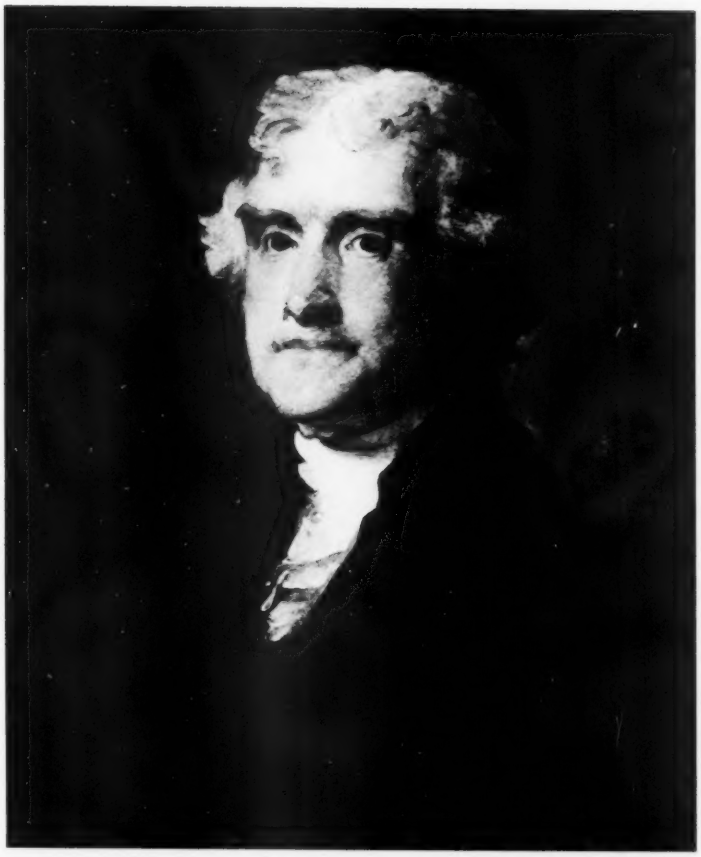


Photo courtesy National Archives

I have sworn . . .
hostility against every form
of TYRANNY
over the mind of man.

Th. Jefferson

. . . We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the Pursuit of Happiness . . . And for the support of this Declaration, with a firm reliance on the protection of Divine Providence, we mutually pledge to each other our Lives, our Fortunes, and our sacred Honor.

Declaration of Independence, adopted July 4, 1776.

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Such forces-in-being give daily evidence of a capability for action which, when coupled with global aerospace forces, exerts a strong deterrent against attack.

Adapted from a painting by Don Jewell.
Courtesy General Electric Company's
Heavy Military Electronics Department